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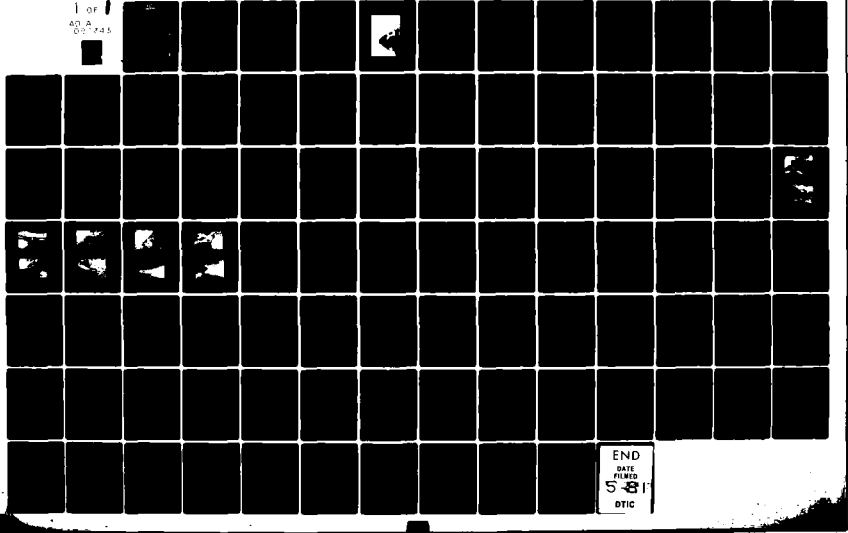

LEVEL II

AD A097343

National Dam Inspection Program

~~DELAWARE RIVER BASIN~~

DYERS RUN ~~NO.~~ Number 3 DAM

MINERSVILLE WATER AUTHORITY

(NDI ~~NO.~~ Number PA-00676
DER NO. 54-038), Delaware Number

SCHUYKILL COUNTY, PENNSYLVANIA.

PHASE I INSPECTION REPORT,

NATIONAL DAM INSPECTION PROGRAM

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PREPARED FOR

DEPARTMENT OF THE ARMY

Baltimore District, Corps of Engineers

Baltimore, Maryland 21203

BY

Berger Associates,

Harrisburg, Pennsylvania 17105

11 FEBRUARY 1981

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PREFACE

This report has been prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT OF GENERAL CONDITIONS
AND RECOMMENDATIONS

Name of Dam: DYERS RUN NO. 3 DAM

State & State No.: PENNSYLVANIA, 54-038

County: SCHUYLKILL

Stream: DYER RUN

Date of Inspection: October 21, 1980

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in good condition.

In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is high. These classifications indicate that the Spillway Design Flood (SDF) should be in the range of one-half the Probable Maximum Flood (PMF) to the full PMF. The recommended SDF for this structure is one-half the PMF. The spillway capacity is adequate for passing only 8 percent of the PMF peak inflow without overtopping the dam. Possible failure of the structure will, however, not significantly increase the hazard downstream. The spillway is considered to be inadequate, but not seriously inadequate.

~~The following~~ Some recommendations ~~are~~ presented for immediate action by the owner: all:

1. That measures shall be taken to provide an adequate spillway capacity,
2. That the left forebay wall be repaired or replaced,
3. That the valves on the blow-off pipes be maintained and operated on a regular basis, and
4. That a formal surveillance and downstream warning system be developed for use during periods of high or prolonged rainfall.

DYERS RUN NO. 3 DAM NDI-ID NO. PA-00676 DER-ID NO. 54-038
MINERSVILLE WATER AUTHORITY SCHUYLKILL COUNTY

5. That an operation and maintenance manual be prepared for guidance in the operation of the dam during normal and emergency conditions, and that a schedule be developed for the annual inspection of the dam and its appurtenant structures.

SUBMITTED BY:

BERGER ASSOCIATES, INC.
HARRISBURG, PENNSYLVANIA

DATE: February 9, 1981

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
HENDRIK JONGSMA
ENGINEER
No. 20575

APPROVED BY:

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

DATE: 4 MARCH 81

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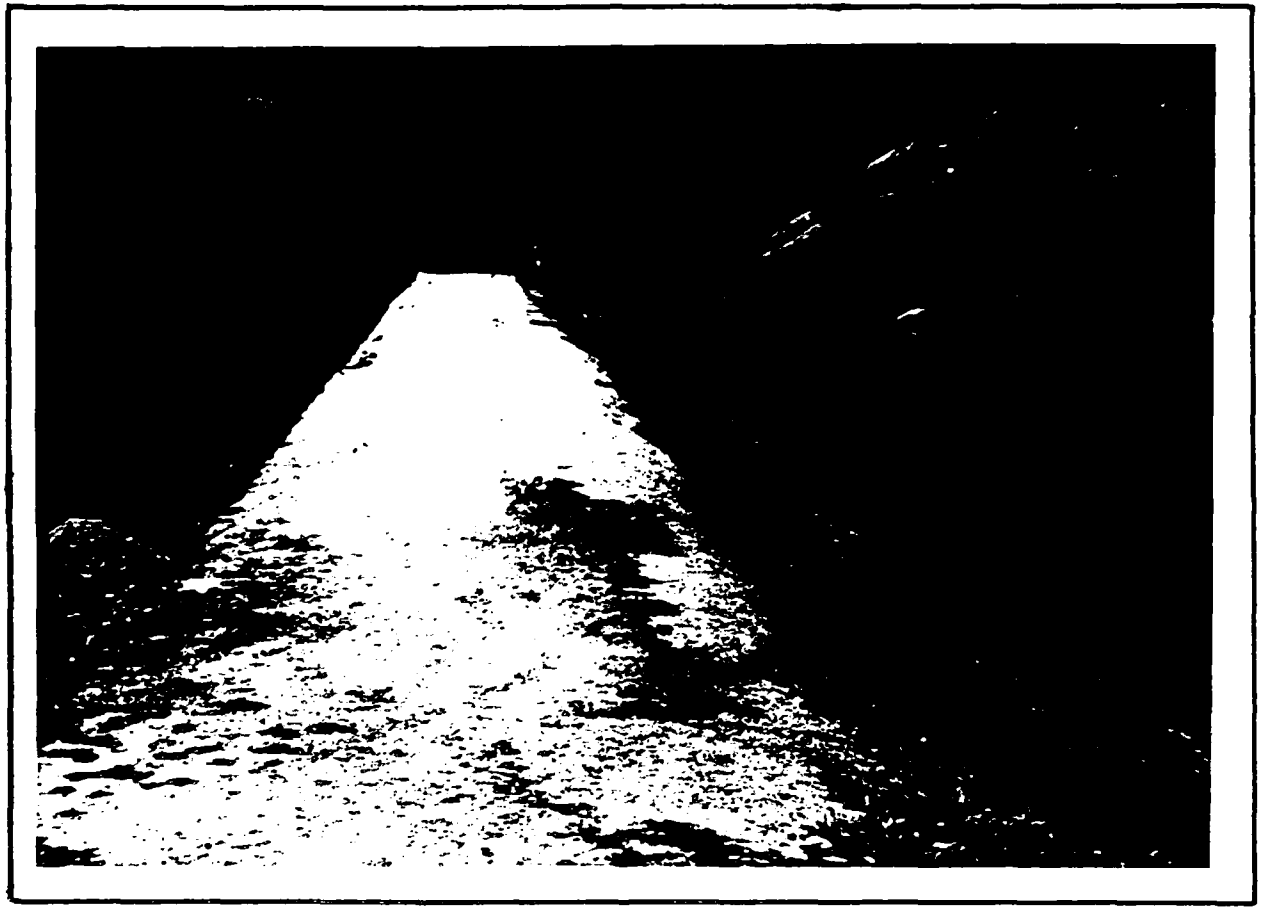

OVERVIEW

DYERS RUN NO. 3 DAM

Photograph No. 1

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DYERS RUN NO. 3 DAM

NDI-ID NO. PA-00676
DER-ID NO. 54-038

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

A. Authority

The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspections of dams throughout the United States.

B. Purpose

The purpose of this inspection is to determine if the dam constitutes a hazard to human life and property.

1.2 DESCRIPTION OF PROJECT

A. Description of Dam and Appurtenances

Note: The normal pool elevation was estimated from the U.S.G.S. quadrangle sheet at elevation 1075. This elevation was assumed to be the top spillway crest during the field inspection.

Dyers Run No. 3 Dam is a dry masonry structure with a vertical downstream face. An earthfill embankment was placed at the upstream side to prevent seepage through the wall. The wall is about 230 feet long and the structure reaches a maximum height of 31 feet above the streambed. The spillway is located in the right abutment and consists of a 45.5 foot wide broad crested weir. The spillway is three feet below the top of the dam and is formed with cemented stone. The downstream side of the spillway is a stepped stone surface until it reaches the natural rock surface channel.

The reservoir is used for water supply. Besides the water supply intake, there are two blow-off valves. About 1.5 miles upstream from this reservoir is the Minersville Dam No. 4 (NDI No. PA-00675) which was inspected in November, 1978.

B. Location: Cass Township, Schuylkill County
U.S.G.S. Quadrangle - Minersville, PA
Latitude 40°-43.5'N, Longitude 76°-16.2'W
Appendix E, Plates I & II

C. Size Classification: Small: Height - 31 feet
Storage - 63 acre-feet

D. Hazard Classification: High (Refer to Section 3.1.E.)

E. Ownership: Minersville Water Authority
Mr. Harry R. Martz, Manager
N. Delaware Ave. & Carbon Street
Minersville, PA 17954

F. Purpose: Water supply

G. Design and Construction History

This structure was constructed in 1856 by a Mr. Charles Kear, Manager of the Minersville Water Company. Reports indicate that there was no engineer retained for the design and that Mr. Kear supervised the construction. There are no records of the design or construction of these facilities.

H. Normal Operating Procedures

The reservoir is used for domestic water supply. Water is taken directly from the reservoir through a pipe which has a downstream control. All inflow above normal pool elevation is discharged through the spillway. The 14-inch blow-off valve is opened to remove leaves in the reservoir and to control water levels.

1.3 PERTINENT DATA

A. Drainage Area (square miles)

From files:	4.44
Computed for this report:	4.92
Use:	4.92

B. Discharge at Dam Site (cubic feet per second)
See Appendix D for hydraulic calculations.

Maximum known flood (estimated from records of U.S.G.S. gage on nearby Trexler Run, June, 1972).	1103
Outlet works at pool Elev. 1075	45

Outlet works at low pool Elev. 1056	24
Spillway capacity at pool Elev. 1078 (low point of dam)	742

C. Elevation (feet above mean sea level)

Top of dam (low point)	1078
Top of dam (design crest)	1078
Spillway crest	1075
Upstream portal invert (estimated)	1049
Downstream portal invert (approximately)	1048
Streambed at downstream toe of dam (estimate)	1047

D. Reservoir (miles)

Length of normal pool (Elev. 1075)	.1
Length of maximum pool (Elev. 1078)	.1

E. Storage (acre-feet)

Spillway crest (Elev. 1075)	55.2
Top of dam (Elev. 1078)	63.0

F. Reservoir Surface (acres)

Spillway crest (Elev. 1075)	2.2
Top of dam (Elev. 1078)	3.0

G. Dam

Refer to Plate III in Appendix E for plan, and Plate A-II in Appendix A for section.

Type:	Gravity masonry wall with an upstream embankment fill.
Length:	230 feet.
Height:	31 feet.
Top Width:	Survey - 14 feet.

Side Slopes:		Surveyed
	Upstream	2H to 1V
	Downstream	Nearly Vertical

Zoning: Downstream masonry wall.

Cutoff: Unknown -- wall placed on rock foundation.

Grouting: None reported.

H. Outlet Facilities

Type: Two cast iron pipes through embankment 14" and 15" diameter.

Closure: 15" pipe has 12" valve on downstream side.
14" pipe has 14" valve on downstream side.

Inlet Elev.: 1049 (estimated).

Location: Both pipes are near right end of dam.

I. Spillway

Type: Masonry broad crested weir.

Location: Right abutment.

Length of Weir: 45.5 feet.

Crest Elevation: 1075

J. Regulating Outlets

See Section 1.3.H. above.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Engineering design data for Dyers Run No. 3 Dam does not exist. The dam was apparently constructed without actual design calculations. The available data consists of a post construction surveyed general plan (Plate III, Appendix E) and inspection reports prepared by the Pennsylvania Department of Environmental Resources (PennDER). The first report, dated April 14, 1914, provides a description of the dam and its appurtenant structures. The spillway discharge capacity was at that time calculated at 870 cfs, well below the required discharge volume. It was stated in that report that overtopping of the dam could be permitted due to the rock foundation of the dam and the shallow overburden below the dam.

2.2 CONSTRUCTION

Records of construction for the dam are not available. The inspection report, dated April, 1914, states that the construction was under the supervision of Mr. Kear, manager of the water company.

2.3 OPERATION

Records of operation have not been maintained by the owner. Inspection reports from PennDER indicate that overtopping of the dam occurred in 1889, 1933 and 1972, without apparent serious damage.

2.4 EVALUATION

A. Availability

The inspection reports are located in the files of PennDER, Harrisburg, Pennsylvania. The post construction surveyed general plan is located in the files of the owner at Minersville, Pennsylvania.

B. Adequacy

The information available from the files is not independently suitable for making a detailed evaluation of the dam. However, the visual inspection, field measurements, and observed condition together with currently developed hydrologic and hydraulic calculations and the available information do permit a reasonable assessment of the condition of the dam and its capacity to pass high discharge flows.

C. Operating Records

There are no formal operating records on file for review, except reports indicating overtopping in several cases. These reports

do not state the depth of overtopping, nor indicate serious damage to the structure.

D. Post Construction Changes

There are no records of post construction changes. Boring holes were drilled in 1971 by Borings, Soils & Testing, Harrisburg, Pennsylvania, under supervision of Gannet, Fleming, Corddry & Carpenter. Casings were left in place and are visible at the present.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

A. General

The general appearance of Dyers Run No. 3 Dam is good. At the time of inspection, the reservoir level was about three feet below its normal level, exposing about six feet of the upstream slope. The downstream masonry wall is in excellent condition. There were no deposits of fill material in the joints and the toe was dry. The broadcrested spillway weir has stone steps on the downstream side over which any overflow would cascade down. The left spillway abutment wall is deteriorating and has considerable spalling. The controls of the valves are in small individual handholes. None of the pipes have an upstream control.

The visual inspection check list and sketches of the general plan and profile of the dam, as surveyed during the inspection, are presented in Appendix A of this report.

Photographs taken on the day of inspection are reproduced in Appendix C. Mr. Martz, Manager of the Water Authority, accompanied the inspectors on the day of inspection.

B. Embankment

The dam structure consists of a dry masonry wall constructed of large blocks of conglomerate rock (Photograph No. 2 & No. 3). The wall appears solid and there were no signs of displacement or bulges. The downstream toe was dry. The wall near the left abutment appears to have been constructed at a later date to provide an access road to the top of the dam.

The crest of the dam is 14 feet wide and has a coarse sand and gravel surface. The upstream side of the masonry wall is backfilled with an earth embankment, presumably to provide a watertight section. The exposed fill has a slope of 2 Horizontal to 1 Vertical. The reservoir was about three feet below its normal pool level due to the limited rainfall experienced in the summer of 1980. The dam is on a straight horizontal alignment. The profile survey (Plate A-II, Appendix A) indicates a profile above its original design crest elevation.

C. Appurtenant Structures

The broad crested spillway weir is located in the right abutment and is constructed of large stone slabs (Photograph No. 6). On the right side, the abutment is formed by natural rock. On the left side there is a small concrete wingwall in the forebay which has cracked (Photograph No. 4). This condition gives a poor appearance, but does

not endanger the safety of the dam at the present time. The downstream side of the spillway consists of about 8 steps formed with stone slabs descending 10 feet vertically over a horizontal distance of 8 feet. Below these steps the spillway channel is formed by natural rock (Photograph No. 8).

The channel makes sharp bends to the left and then to the right (Plate A-I, Appendix A). The left side of the discharge channel is formed with stone masonry walls (Photographs Nos. 8, 9 & 10).

The outlet structure consists of a 14-inch pipe through the embankment and wall terminating in the spillway channel. The upstream end is open and the control valve is located in a small pit at the downstream toe of the dam. Another blow-off line originates in the valve pit for the supply line. This valve is reported to be 12 inches on a 15 or 16-inch line. The blow-off valves are opened during high pool levels and to remove leaves from the reservoir.

Water was heard running benind the left spillway wall about 60 feet below the downstream toe and water appeared in the channel about 40 feet further downstream even though the reservoir water level was below the spillway crest elevation.

D. Reservoir

The reservoir is surrounded by steep, wooded slopes. The banks appear to be stable. Upstream from the inspected reservoir is Minersville Dam No. 4 (NDI No. PA-00675). A Phase I report was submitted for that dam in April, 1979. Another small reservoir is located about half a mile upstream. This reservoir is an open pit mine with a small outlet pipe. During the Agnes storm in June, 1972, a partial breach of the embankment caused a small flood wave which caused overtopping at No. 4 and No. 3 dams.

E. Downstream Channel

The downstream channel is a natural stream with wooded and brush covered banks. The drop is steep and the channel is narrow and deep. Several homes are located about 1750 feet downstream from the dam near the point where Dyer Run passes underneath a state highway. There is a potential hazard for loss of life if the dam fails. The hazard category for the dam is considered to be "high."

3.2 EVALUATION

The visual inspection of Dyers Run No. 3 Dam indicates that the facilities are in good condition. The downstream masonry wall is in excellent condition and appears to be founded on rock. The rock downstream from the toe is apparently close to the surface. It is judged that a limited amount of overtopping would cause no serious problems.

The left wingwall should be repaired for proper functioning during periods of large discharges. The pipes do not have an upstream closure. This, however, is not considered serious for this type of structure.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Dyers Run No. 3 Dam is used for domestic water supply and a reservoir pool level at the crest of the weir is maintained by the owner. All inflow above this level is discharged through the spillway. Mr. Martz stated that the blow-off valves are opened when the pool level reaches one or two feet above the spillway crest.

4.2 MAINTENANCE OF DAM

The crest of the dam is in excellent condition. A sand and gravel surface was placed on the surface after hurricane Agnes. There is no excessive growth of weed or brush on the upstream slope and the downstream wall has a clean surface.

4.3 MAINTENANCE OF OPERATING FACILITIES

The valves are located in small handholes and little maintenance work is performed. They are apparently used once or twice a year. The spillway is in good condition with the exception of the left forebay wall.

4.4 WARNING SYSTEM

There is no formally organized surveillance and downstream warning system in existence at the present time.

4.5 EVALUATION

The operational procedures for Dyers Run No. 3 Dam are minimal at the present time. Although the dam is in good condition, operational procedures should include the maintenance of valves and the repair of the forebay wall. A formal surveillance and downstream warning system should be developed for implementation during periods of high or prolonged rainfall.

SECTION 5 - HYDROLOGY/HYDRAULICS

5.1 EVALUATION OF FEATURES

A. Design Data

The hydrologic and hydraulic analysis available from PennDER for Dyers Run No. 3 Dam was not very extensive. No area-capacity curve, frequency curve, unit hydrograph, design storm, design flood hydrograph, or flood routings were available.

B. Experience Data

It was reported that the dam was overtopped in 1972 when an upstream embankment at a strip mine was breached. However, there are no records of flood levels at Dyers Run No. 3 Dam. Based on records of the U.S.G.S. stream gage on Trexler Run at nearby Ringtown, Pennsylvania, the maximum inflow to Dam No. 3 is estimated to be 1103 cfs. This flood was passed without significant damage.

C. Visual Observations

On the date of the inspection, no conditions were observed that would indicate that the appurtenant structures of the dam could not operate satisfactorily until the dam is overtopped. Upstream of Dam No. 3 is Dam No. 4, a water supply facility. This impoundment was included in the calculations contained in Appendix D.

D. Overtopping Potential

Dyers Run No. 3 Dam has a total storage capacity of 63 acre-feet and an overall height of 31 feet above streambed. These dimensions indicate a size classification of "small." The hazard classification is "high" (see Section 3.1.E.).

The recommended Spillway Design Flood (SDF) for a dam having the above classifications is in the range of one-half the Probable Maximum Flood (PMF) to the full PMF. For this dam, the recommended SDF is one-half the PMF. The SDF peak inflow is 4711 cfs (see Appendix D for HEC-1 inflow computations).

Comparison of the estimated SDF peak inflow of 4711 cfs with the estimated spillway discharge capacity of 742 cfs indicates that a potential for overtopping of the Dyers Run No. 3 Dam.

An estimate of the storage effect of the reservoir and routing of the computed inflow hydrograph through the reservoir shows that this dam does not have the necessary storage available to pass the SDF without

overtopping. The spillway-reservoir system can pass a flood event equal to 8% of a PMF without overtopping based on the existing low point of the dam profile.

E. Dam Break Evaluation

The calculations to determine the behavior of the dam in the event of an overtopping and a resulting breaching of the embankment indicates that there will not be a substantial increase in water levels downstream from the dam.

Several houses are located about 1750 feet downstream from the dam. On the basis of the results of the dam break analysis, using the U.S. Army Corps of Engineers HEC-1 program, the water surface elevations in the vicinity of the houses have been compared for several conditions prior to and after a dam br.ak (refer to Table 1, Appendix D). For a dry rubble masonry, it is estimated that 2 feet of overtopping would result in a breach. Calculations indicate that 30 percent of the PMF inflow would cause an overtopping of 2 feet. The increase in water levels downstream due to overtopping of 2 feet with no failure as compared to no overtopping would be 1.4 feet. While more property would be exposed to flooding, the increase in the hazard to loss of life is not considered significant. With failure, the breaching analysis indicates a rise of 0.1 foot above the flow level just prior to breach when considering a 2 hour time to complete the breach and no rise above flow level just prior to breach when considering a six hour time to complete the breach. The increase in hazard to loss of life and property damage is not considered to be significantly increased due to overtopping and breaching.

Being a dry rubble masonry embankment, it is judged that the breach would be completed between the 2 hour and the six hour period. The numerical difference of water levels is 0.1 foot. The property damage would be similar with either time of failure. The time factor, however, is most significant regarding loss of life. Calculations indicate that the water depth will increase at a rate of only 0.1 foot in 45 minutes under the 2 hour breach condition.

One manmade dam is located upstream of Dyers Run No. 3 Dam. For this evaluation, this impoundment was not considered to have breached (see Appendix D).

On the basis of these calculations, it is concluded that the hazard to loss of life and property damage is not significantly increased when the dam is overtopped and failed as compared to the condition just prior to failure.

Refer to Table 1, Appendix D, for comparison of flood water levels.

F. Spillway Adequacy

The small size category and high hazard category, in accordance with the Corps of Engineers criteria and guidelines, indicates that the SDF for this dam should be in the range of one-half the PMF to the full PMF. The recommended SDF is one-half PMF.

Calculations show that the spillway discharge capacity and reservoir storage capacity combine to handle 8% of the PMF (refer to Appendix D).

Although the spillway discharge and reservoir storage capacity cannot pass one-half of the PMF and the downstream hazard to loss of life is high, this hazard is not significantly increased when the dam fails as compared to just prior to failure. The spillway is, therefore, judged to be inadequate but not seriously inadequate.

The hydrologic analysis for this investigation was based upon existing conditions of the watershed. The effects of future development were not considered.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

A. Visual Observations

1. Embankment

The visual inspection of Dyers Run No. 3 Dam did not detect any signs of instability. The downstream wall was in excellent condition without bulges or apparent movements. The upstream blanket of impervious material is effective with the low pool level at the time of inspection. No apparent seepage was detected, although some water appeared 100 feet downstream from the dam.

2. Appurtenant Structures

The spillway weir and discharge channel are in good condition. There were no signs of instability except that the left forebay wall had settled and cracked. The impervious blanket is upstream from the spillway and there were no signs of seepage from this area. Most of the spillway chute has a rock lined bottom.

B. Design and Construction Data

1. Embankment

Design and construction data are not available for review. In 1971 test borings were made through the structure. Three holes were located on top of the dam and four holes were on the upstream slope.

The boring results indicate that the underlying rock consisted of hard sandstone, badly broken with weathered seams.

2. Appurtenant Structures

Design and construction data are not available for review of the details of these structures.

C. Operating Records

Operating records for this dam have not been maintained by the owner. There are no indications that problems were encountered. Reports indicate that the dam has been overtopped on at least three occasions, without serious damage.

D. Post Construction Changes

There are no records of changes to the embankment or its appurtenant structures.

E. Seismic Stability

This dam is located in Seismic Zone 1, and it is considered that the static stability is sufficient to withstand minor earthquake-induced dynamic forces. No studies or calculations have been made to confirm this assumption.

SECTION 7 - ASSESSMENT AND RECOMMENDATIONS

7.1 DAM ASSESSMENT

A. Safety

The visual inspection and the review of the available data indicate that Dyers Run No. 3 Dam is in good condition. The field inspection did not detect any signs of instability. Past history indicates that overtopping has not caused any damage or endangered the safety of the dam.

The hydrologic and hydraulic computations indicate that the combination of storage capacity and the spillway discharge capacity are insufficient to pass the SDF. Thirty percent of the PMF would cause possible failure of the dam. This failure would, however, have no significant influence on the downstream hazard. The spillway is considered to be inadequate, but not seriously inadequate.

B. Adequacy of Information

The design information contained in the files combined with the visual inspection are considered sufficiently adequate for making a reasonable assessment of this dam.

C. Urgency

The recommendations presented below should be implemented immediately.

D. Additional Studies

Additional investigations are required to determine measures necessary to provide an adequate spillway capacity.

7.2 RECOMMENDATIONS

In order to assure the continued satisfactory operation of this dam, the following recommendations are presented for immediate implementation by the owner:

1. That measures shall be taken to provide an adequate spillway capacity.

2. That the left forebay wall be repaired or replaced.

3. That the valves on the blow-off pipes be maintained and operated on a regular basis.

4. That a formal surveillance and downstream warning system be developed for use during periods of high or prolonged rainfall.

5. That an operation and maintenance manual be prepared for guidance in the operation of the dam during normal and emergency conditions, and that a schedule be developed for the annual inspection of the dam and its appurtenant structures.

APPENDIX A

CHECK LIST OF VISUAL INSPECTION REPORT

CHECK LIST

PHASE I - VISUAL INSPECTION REPORT

PA DER # 054-38 NDI NO. PA-00 676

NAME OF DAM Dyers Run No. 3 Dam HAZARD CATEGORY High

TYPE OF DAM Stone masonry and earthfill.

LOCATION Cass TOWNSHIP Schuylkill COUNTY, PENNSYLVANIA

INSPECTION DATE 10/21/80 WEATHER Overcast TEMPERATURE 40-50

INSPECTORS: R. Houseal (Recorder) OWNER'S REPRESENTATIVE(s):

H. Jongsma Harry Martz

R. Shireman

A. Bartlett

NORMAL POOL ELEVATION: 1075.0 (Estimated USGS) AT TIME OF INSPECTION:

BREAST ELEVATION: 1078 POOL ELEVATION: 1071.8

SPILLWAY ELEVATION: 1075.0 TAILWATER ELEVATION:

MAXIMUM RECORDED POOL ELEVATION: No records.

GENERAL COMMENTS:

Reservoir appears to be about 3 feet below normal pool. About six feet of upstream slope is exposed. Crest was overtopped in 1972 when upstream Dam #5 (a strip mine embankment) breached.

Reservoir was desilted in 1959 and 1977.

NDI NO. PA-00 676

VISUAL INSPECTION
EMBANKMENT

	OBSERVATIONS AND REMARKS
A. SURFACE CRACKS	None observed. Dam consists of about 14 feet of stone wall and an upstream fill.
B. UNUSUAL MOVEMENT BEYOND TOE	N/A.
C. SLOUGHING OR EROSION OF EMBANKMENT OR ABUTMENT SLOPES	None observed.
D. ALIGNMENT OF CREST: HORIZONTAL: VERTICAL:	Horizontal uniform. Vertical - see profile Plate A-II.
E. RIPRAP FAILURES	No riprap visible on upstream slope.
F. JUNCTION EMBANKMENT & ABUTMENT OR SPILLWAY	Junction is sound at left hillside. At right side abuts spillway.
G. SEEPAGE	None observed. Water was heard running behind the left spillway wall and appeared about 100 feet downstream of the dam in the spillway channel.
H. DRAINS	None.
J. GAGES & RECORDER	None.
K. COVER (GROWTH)	Crest has a coarse sand and gravel surface. Appears to be 8" to 10" thick; short weeds on upstream slope (about 3 feet to normal pool elevation). Downstream clean vertical stone wall.

NDI NO. PA-00 676

VISUAL INSPECTION
OUTLET WORKS

	OBSERVATIONS AND REMARKS
A. INTAKE STRUCTURE	None - open pipes with downstream control.
B. OUTLET STRUCTURE	Three valves: one valve on 14" blow-off pipe. one valve on 12" bypass pipe. one valve on 8" drain pipe.
C. OUTLET CHANNEL	Pipes outlet in downstream channel.
D. GATES	None.
E. EMERGENCY GATE	None.
F. OPERATION & CONTROL	Valves opened during extreme high pool levels and to remove leaves in fall.
G. BRIDGE (ACCESS)	None.

NDI NO. PA-00 676

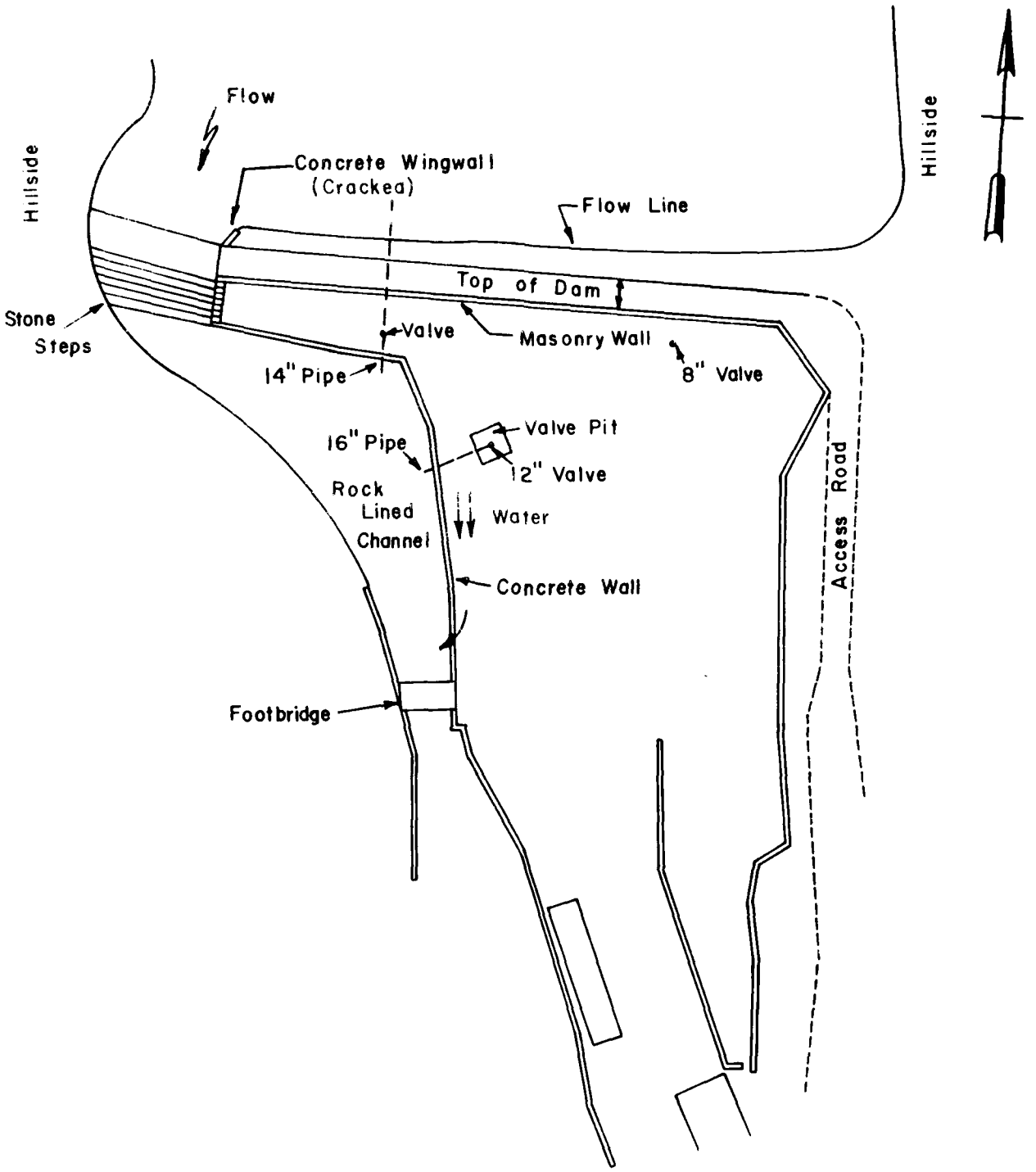
VISUAL INSPECTION
SPILLWAY

	OBSERVATIONS AND REMARKS
A. APPROACH CHANNEL	Approach to spillway is directly from the reservoir on the right side. The area is clear without obstructions.
B. WEIR: Crest Condition Cracks Deterioration Foundation Abutments	Broad crested stone masonry weir with a stepped run-out. The masonry is in fair condition and appears to be stable.
C. DISCHARGE CHANNEL: Lining Cracks Stilling Basin	Portions of the discharge channel are composed of masonry stone. But most of it has been formed by excavation into natural rock (sandstone and conglomerate).
D. BRIDGE & PIERS	None.
E. GATES & OPERATION EQUIPMENT	None.
F. CONTROL & HISTORY	No control. Dam was overtopped during Agnes by about 4 inches at several places. New gravel was placed on top of dam since 1972.

NDI NO. PA-00676

VISUAL INSPECTION

	OBSERVATIONS AND REMARKS
INSTRUMENTATION	
Monumentation	None.
Observation Wells	None.
Weirs	None.
Piezometers	None.
Staff Gauge	None.
Other	None.
RESERVOIR	
Slopes	Woodlands - 20°-30°.
Sedimentation	Reported 1959 and 1977. Desilted.
Watershed Description	Forest.
DOWNSTREAM CHANNEL	
Condition	Rock lined channel.
Slopes	Stable.
Approximate Population	Ten.
No. Homes	Three within 1750 feet.



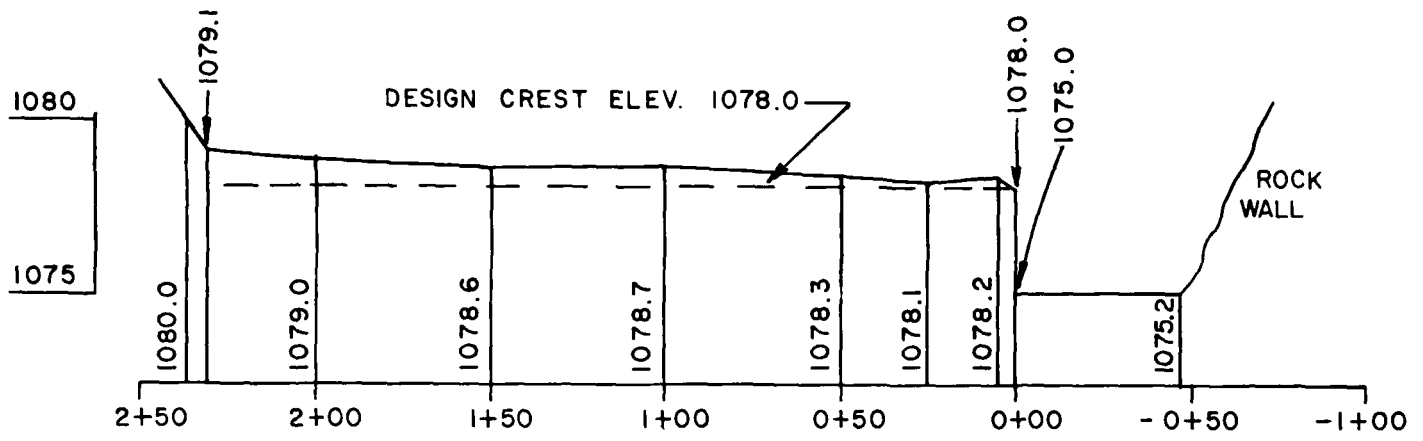
DYERS RUN DAM No. 3

PA - 00676

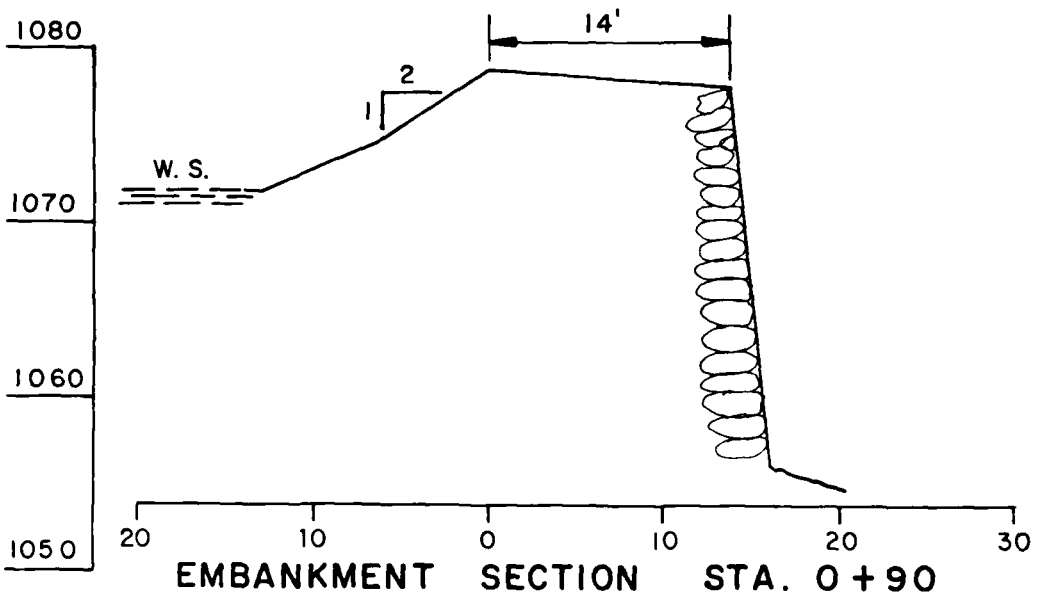
INSPECTION SURVEY

SURVEYED 10 - 21 - 80

PLATE A-I



EMBANKMENT PROFILE



EMBANKMENT SECTION STA. 0+90

SURVEYED 10-21-80

DYERS RUN DAM No. 3

PA-00676

INSPECTION SURVEY

PLATE A-II

APPENDIX B

CHECK LIST OF ENGINEERING DATA

CHECK LIST
ENGINEERING DATA

PA DER # 54-038 NDI NO. PA-00 676

NAME OF DAM Dyers Run No. 3 Dam

ITEM	REMARKS
AS-BUILT DRAWINGS	Not existing.
REGIONAL VICINITY MAP	U.S.G.S. Quadrangle - Minersville, Pa. See Plate II, Appendix E
CONSTRUCTION HISTORY	Constructed in 1856 by the Water Authority. No records of design and construction.
GENERAL PLAN OF DAM	A post construction general plan prepared probably in 1971. Plate III, Appendix E.
TYPICAL SECTIONS OF DAM	Not available.
OUTLETS: PLAN DETAILS CONSTRAINTS DISCHARGE RATINGS	Not available.

NDI NO. PA-00 676

ENGINEERING DATA

ITEM	REMARKS
RAINFALL & RESERVOIR RECORDS	No records. Dam was overtopped in 1889, 1933 and 1972.
DESIGN REPORTS	None.
GEOLOGY REPORTS	None.
DESIGN COMPUTATIONS: HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None.
MATERIALS INVESTIGATIONS: BORING RECORDS LABORATORY FIELD	In 1971 borings were made through crest of dam and the upstream fill.
POST CONSTRUCTION SURVEYS OF DAM	Plate III, Appendix E.
BORROW SOURCES	Unknown.

ENGINEERING DATA

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	None.
HIGH POOL RECORDS	No records.
POST CONSTRUCTION ENGINEERING STUDIES & REPORTS	Plate III, Appendix E. Borings were made in 1971 under supervision of CFCC. No changes were made to the structure. No report summarizing the test results.
PRIOR ACCIDENTS OR FAILURE OF DAM Description: Reports:	No failures. Crest was overtopped in 1889, 1933 and 1972. In 1972 the spillway was "severely cracked" and overtopping caused a small plunge hole (2 cubic yards) at toe.
MAINTENANCE & OPERATION RECORDS	No records.
SPILLWAY PLAN, SECTIONS AND DETAILS	Not available.

NDI NO. PA-00 676

ENGINEERING DATA

ITEM	REMARKS
OPERATING EQUIPMENT, PLANS & DETAILS	No plans.
CONSTRUCTION RECORDS	None.
PREVIOUS INSPECTION REPORTS & DEFICIENCIES	Inspection reports by PennDER in 1914, 1918, 1922, 1927, 1929, 1932, 1938, 1942, 1946, 1962 and 1972. No deficiencies.
MISCELLANEOUS	

NDI NO. PA-00 676

CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Woodland

ELEVATION:

TOP NORMAL POOL & STORAGE CAPACITY: Elev. 1075 Acre-Feet 55.2

TOP FLOOD CONTROL POOL & STORAGE CAPACITY: Elev. 1078 Acre-Feet 63

MAXIMUM DESIGN POOL: Elev. 1078

TOP DAM: Elev. 1078

SPILLWAY:

a. Elevation 1075

b. Type Masonry broad crested weir.

c. Width 45.5'

d. Length ---

e. Location Spillover Right abutment.

f. Number and Type of Gates None.

OUTLET WORKS:

a. Type Two cast iron pipes - 14" and 15" diameter.

b. Location Near right side of dam.

c. Entrance inverts 1049 (estimated).

d. Exit inverts 1048

e. Emergency drawdown facilities Two pipes.

HYDROMETEOROLOGICAL GAGES:

a. Type None.

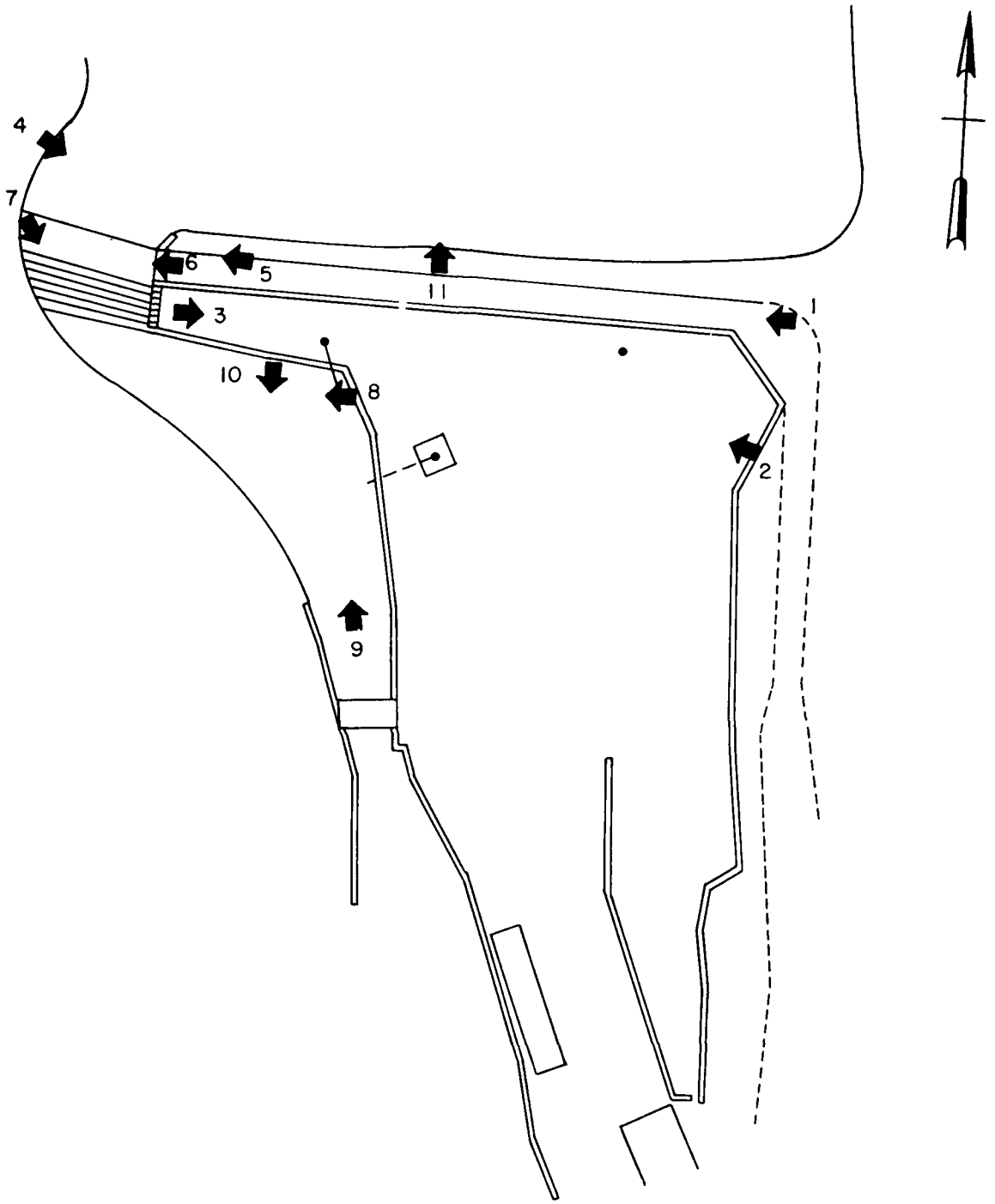
b. Location

c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 742 cfs.

APPENDIX C

PHOTOGRAPHS

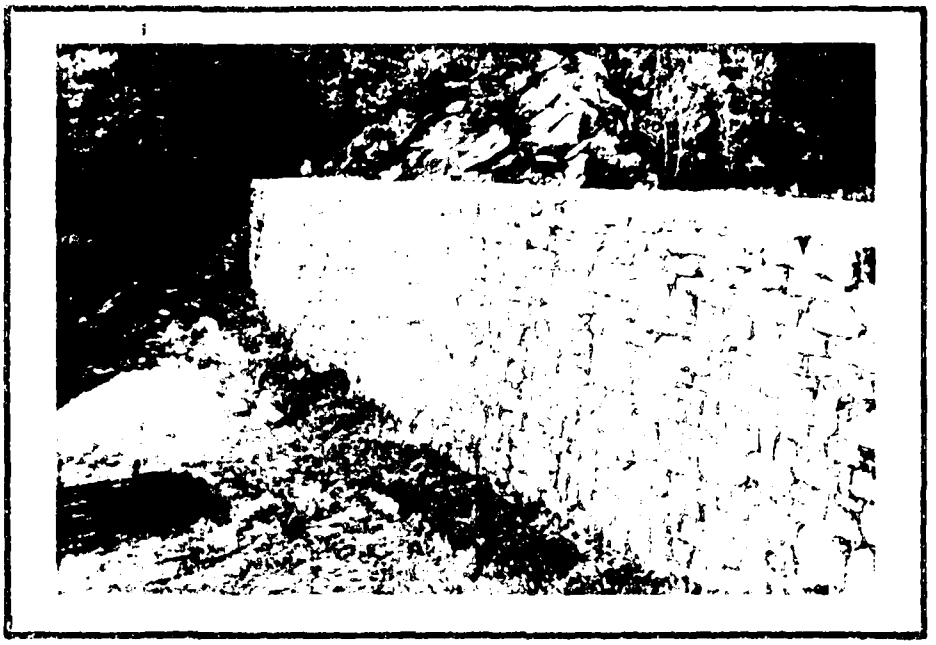


DYERS RUN DAM No. 3

PA - 00676

KEY MAP OF PHOTOGRAPHS

PLATE C-1

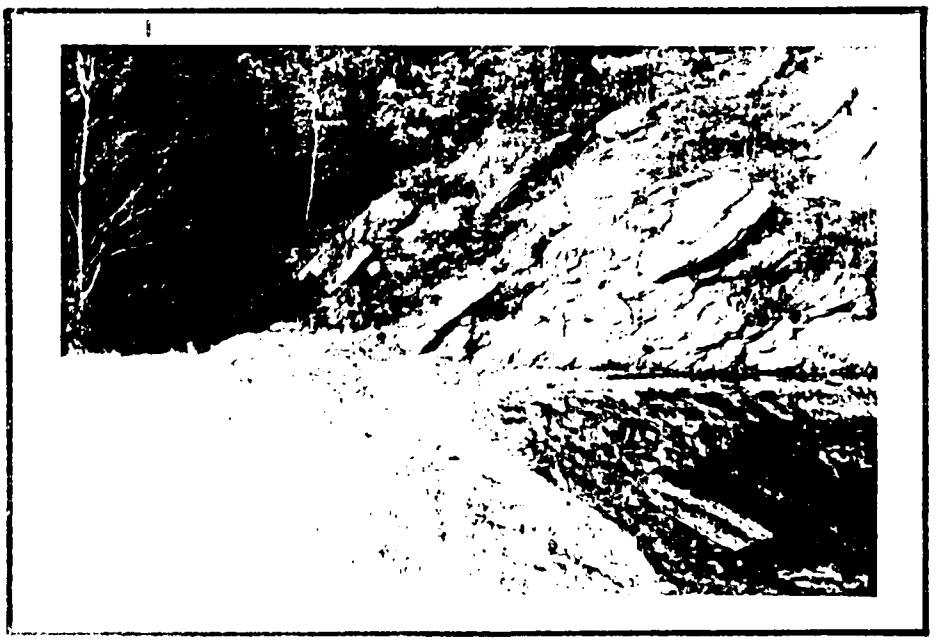


DOWNSTREAM MASONRY WALL
LOOKING TO RIGHT ABUTMENT - NO. 2

LOOKING TO LEFT ABUTMENT - NO. 3

PA-00626
Plate C-12

DOWNSTREAM SLOPE AND LEFT SPILLWAY ABUTMENT WALL - NO. 4



LOOKING ALONG RIGHT SPILLWAY ABUTMENT - NO. 5

DOWNSTREAM STEPS OF SPILLWAY - NO. 6

SPILLWAY CHUTE AND DISCHARGE CHANNEL - NO. 7

PA-00676
Plate C-IV

VIEW FROM SPILLWAY CHUTE - NO. 8

BLOW OFF PIPES OUTLET IN SPILLWAY CHANNEL - NO. 9

PA-00676
Plate C-V

SPILLWAY OUTLET CHANNEL - NO. 10

RESERVOIR - NO. 11

PA-00676
Plate C-VI

APPENDIX D

HYDROLOGY AND HYDRAULIC CALCULATIONS

SUMMARY DESCRIPTION
OF
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION

The hydrologic and hydraulic evaluation for this inspection report has employed computer techniques using the Corps of Engineers computer program identified as the Flood Hydrograph Package (HEC-1) Dam Safety Version.

The program has been designed to enable the user to perform two basic types of hydrologic analyses: (1) the evaluation of the overtopping potential of the dam, and (2) the capability to estimate the downstream hydrologic-hydraulic consequences resulting from assumed structural failures of the dam. A brief summary of the computation procedures typically used in the dam overtopping analysis is shown below.

- Development of an inflow hydrograph to the reservoir.
- Routing of the inflow hydrograph(s) through the reservoir to determine if the event(s) analyzed would overtop the dam.
- Routing of the outflow hydrograph(s) of the reservoir to desired downstream locations. The results provide the peak discharge and maximum stage of each routed hydrograph at the outlet of the reach.

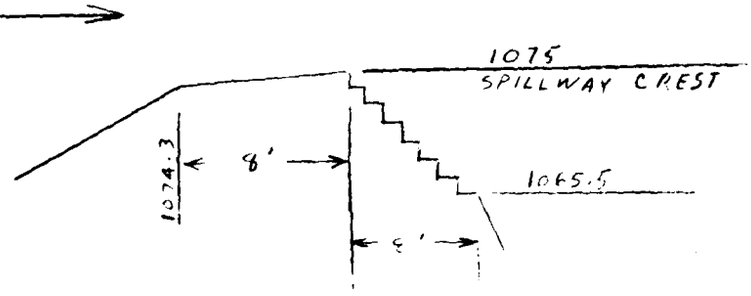
The output data provided by this program permits the comparison of downstream conditions just prior to a breach failure with that after a breach failure and the determination as to whether or not there is a significant increase in the hazard to loss of life as a result of such a failure.

The results of the studies conducted for this report are presented in Section 5.

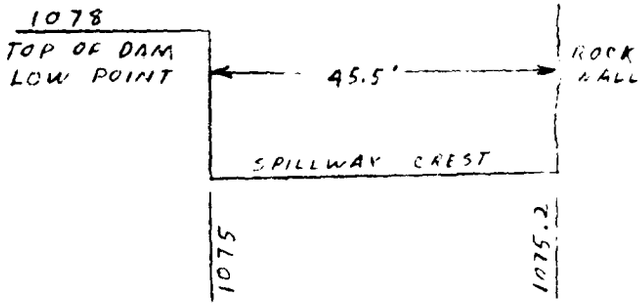
For detailed information regarding this program refer to the Users Manual for the Flood Hydrograph Package (HEC-1) Dam Safety Version prepared by the Hydrologic Engineering Center, U.S. Army Corps of Engineers, Davis, California.

BY RLS DATE 11/26/80 **BERGER ASSOCIATES** SHEET NO. 1 OF 7
CHKD. BY DATE PROJECT D0590
SUBJECT DYER RUN DAM #3

SPILLWAY RATING



BROAD CRESTED WEIR
C = 3.3 (KING'S HDBK)



$Q = C\ L\ H^{3/2}$

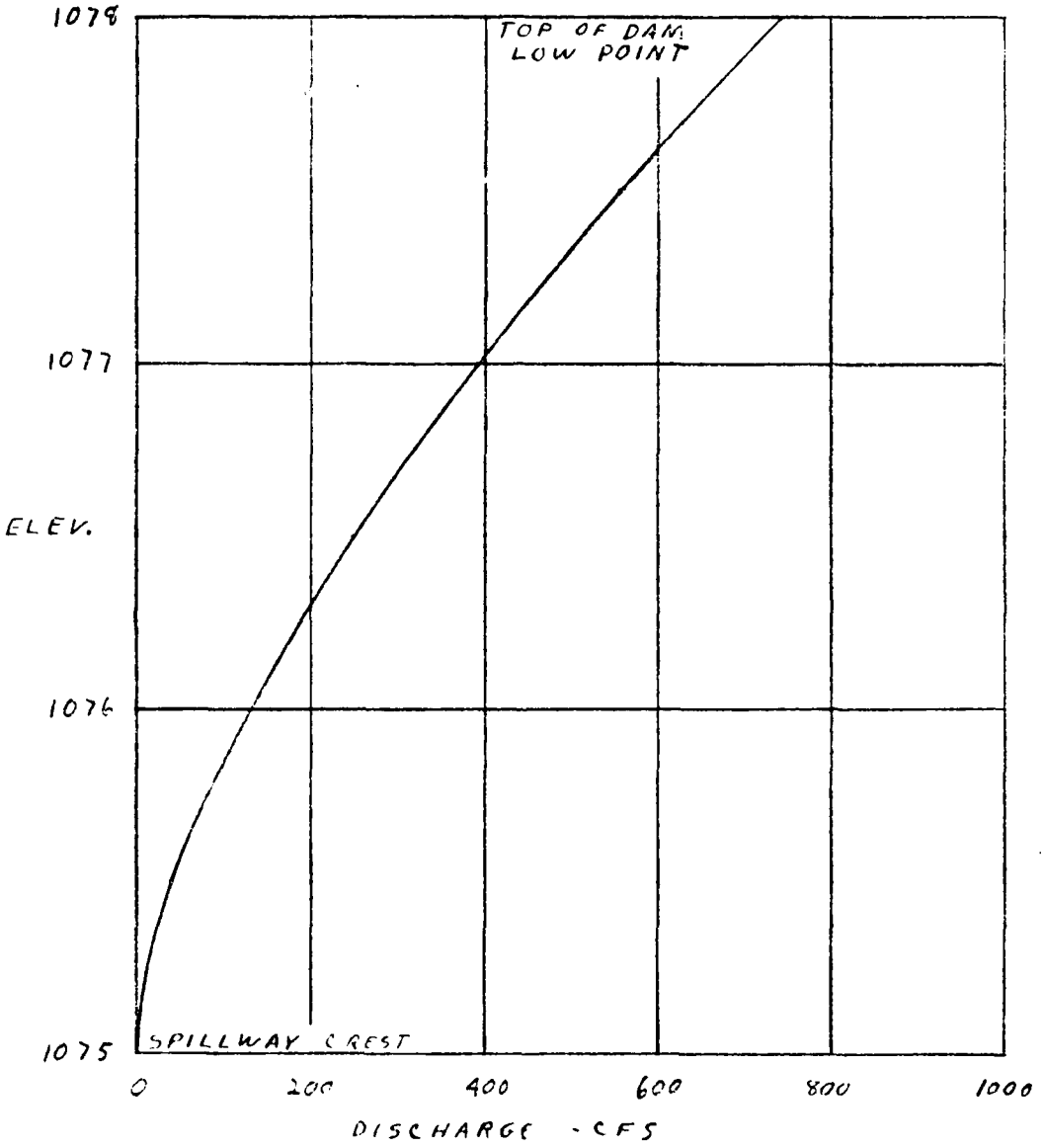
$H = 1078 - ((1075 + 1075.2)/2) = 2.9'$

$Q = 3.3 \times 45.5 \times (2.9)^{1.5}$

$= 742$ CFS

BY RLS DATE 11/26/80 **BERGER ASSOCIATES** SHEET NO. 2 OF 7
CHKD. BY DATE PROJECT D0590
SUBJECT DYER PUMP DAM #3

SPILLWAY RATING CURVE



BY RLS DATE 11/26/80 **BERGER ASSOCIATES** SHEET NO. 1 OF 7
CHKD. BY ____ DATE ____ PROJECT 00590
SUBJECT DYER RUN DAM #3

DISCHARGE THROUGH OUTLET WORKS

14" BLOWOFF PIPE
12" VALVE ON 15" BYPASS PIPE

APPROXIMATE CENTERLINE ELEVATION = 1049 EACH PIPE

C = 0.6 EACH PIPE (KING'S HDBK.)

$Q = CA\sqrt{2gH}$

AT POOL LEVEL 1075

$H = 1075 - 1049 = 26'$

$$Q = \left(0.6 \times \pi \times (1)^2/4 \times (2 \times 32.2 \times 26)^{0.5}\right) + \left(0.6 \times \pi \times (14/12)^2/4 \times (2 \times 32.2 \times 26)^{0.5}\right)$$

$= 19 + 26 = 45$ CFS

AT LOW POOL LEVEL 1056

$H = 1056 - 1049 = 7'$

$$Q = \left(0.6 \times \pi \times (1)^2/4 \times (2 \times 32.2 \times 7)^{0.5}\right) + \left(0.6 \times \pi \times (14/12)^2/4 \times (2 \times 32.2 \times 7)^{0.5}\right)$$

$= 10 + 14 = 24$ CFS

BY [illegible] DATE 11/[illegible]/80 **BERGER ASSOCIATES** SHEET NO. [illegible] OF 7
CHKD. BY DATE PROJECT D0590
SUBJECT DYLL RUN DAM #3

EMBANKMENT RATING

$Q = CLH^{3/2}$ $C = 2.7$ ([illegible] HDBK)

AT ELEV. 1078.5

$2.7 \times 6 \times (.4)^{1.5} = 4$
$2.7 \times 19 \times (.35)^{1.5} = 11$
$2.7 \times 25 \times (.3)^{1.5} = 11$
$2.7 \times 25 \times (.1)^{1.5} = 2$ $\Sigma = 28$ CFS

AT ELEV. 1079

$2.7 \times 6 \times (.9)^{1.5} = 14$
$2.7 \times 19 \times (.85)^{1.5} = 40$
$2.7 \times 25 \times (.8)^{1.5} = 48$
$2.7 \times 50 \times (.5)^{1.5} = 48$
$2.7 \times 50 \times (.45)^{1.5} = 41$
$2.7 \times 50 \times (.2)^{1.5} = 12$ $\Sigma = 203$ CFS

AT ELEV 1079.5

$2.7 \times 6 \times (1.4)^{1.5} = 27$
$2.7 \times 19 \times (1.35)^{1.5} = 80$
$2.7 \times 25 \times (1.3)^{1.5} = 100$
$2.7 \times 50 \times (1)^{1.5} = 135$
$2.7 \times 50 \times (.95)^{1.5} = 125$
$2.7 \times 50 \times (.7)^{1.5} = 70$
$2.7 \times 30 \times (.45)^{1.5} = 24$
$2.7 \times 2 \times (.2)^{1.5} =$ $\Sigma = 561$ CFS

AT ELEV 1080

$2.7 \times 6 \times (1.9)^{1.5} = 42$
$2.7 \times 19 \times (1.85)^{1.5} = 129$
$2.7 \times 25 \times (1.8)^{1.5} = 163$
$2.7 \times 50 \times (1.5)^{1.5} = 248$
$2.7 \times 50 \times (1.45)^{1.5} = 236$
$2.7 \times 50 \times (1.2)^{1.5} = 177$
$2.7 \times 30 \times (.95)^{1.5} = 75$
$2.7 \times 5 \times (.45)^{1.5} = 4$ $\Sigma = 1074$ CFS

AT ELEV 1081 $\Sigma = 2379$ CFS
AT ELEV 1082 $\Sigma = 3996$ CFS
AT ELEV 1083.5 $\Sigma = 6900$ CFS

BY [illegible] DATE [illegible] **BERGER ASSOCIATES** SHEET NO. [illegible] OF 7
CHKD. BY DATE PROJECT [illegible]
SUBJECT [illegible] DAM #[illegible]

MAXIMUM KNOWN FLOOD AT DAM[illegible]

IT WAS REPORTED THAT THIS DAM WAS OVERTOPPED IN 1972 WHEN A UPSTREAM EMBANKMENT [illegible] STRIP MINE BREACHED. HOWEVER, THERE ARE NO RECORDS OF FOOD LEVELS [illegible] THIS DAM. BASED ON THE RECORDS [illegible] GAGING STATION FOR TREXLER RUN AT [illegible] [illegible]TOWN PA. (DA 1.77 SQ MI.) THE MAXIMUM DISCHARGE AT THE GAGE OCCURRED IN JUNE 1972 WHEN A DISCHARGE OF 487 CFS WAS OBSERVED. THE MAXIMUM INFLOW TO DYERS RUN DAM #[illegible] IS ESTIMATED TO BE:

$$Q = \left(\frac{4.9[illegible]}{1.77}\right)^{0.9} \times 48[illegible]$$

$$= [illegible] \text{ CFS}$$

DESIGN FLOOD

SIZE CLASSIFICATION
MAXIMUM HEIGHT = [illegible] FEET
MAXIMUM STORAGE = 63 ACRE FEET
SIZE CLASSIFICATION IS "SMALL"

HAZARD CLASSIFICATION
SEVERAL HOUSES LOCATED ALONG THE DOWNSTREAM CHANNEL
USE "HIGH"

RECOMMENDED SPILLWAY DESIGN FLOOD
THE ABOVE CLASSIFICATIONS [illegible] USE OF AN SDF EQUAL TO ONE HALF [illegible] TO THE PROBABLE MAXIMUM FLOOD.

BY [illegible] DATE 11/6/80 **BERGER ASSOCIATES** SHEET NO. 6 OF 7

CHKD BY DATE PROJECT D0590

SUBJECT DYER RIVER DAM #3

CRYSTAL RESERVOIR

DAM A: (DATA FROM PHASE I INSPECTION REPORT)

37 FT. HIGH

760 FT LONG

BROADCRESTED WEIR C = 3.32

EFFECTIVE WIDTH = 60'

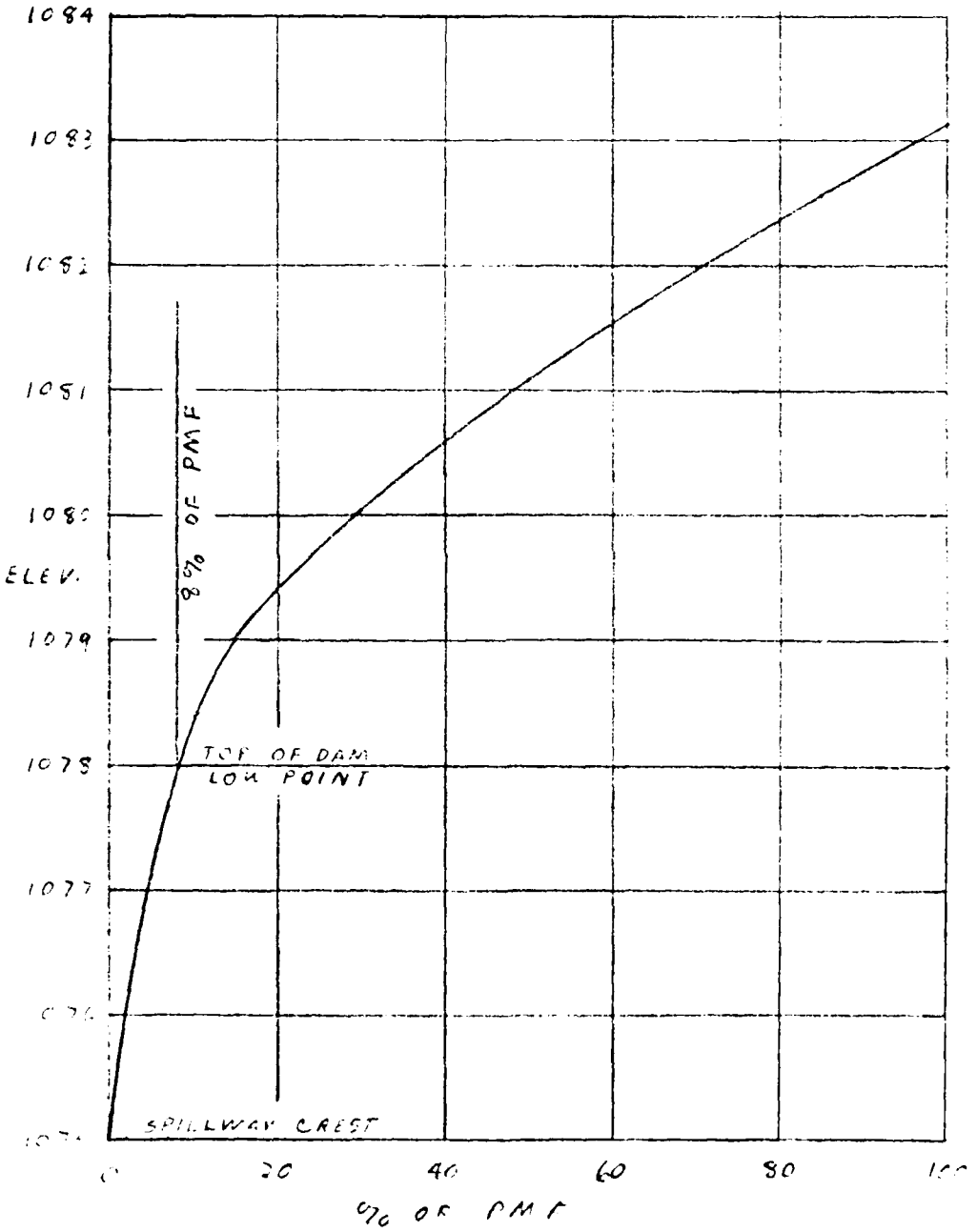
CREST ELEV. = 1466.2

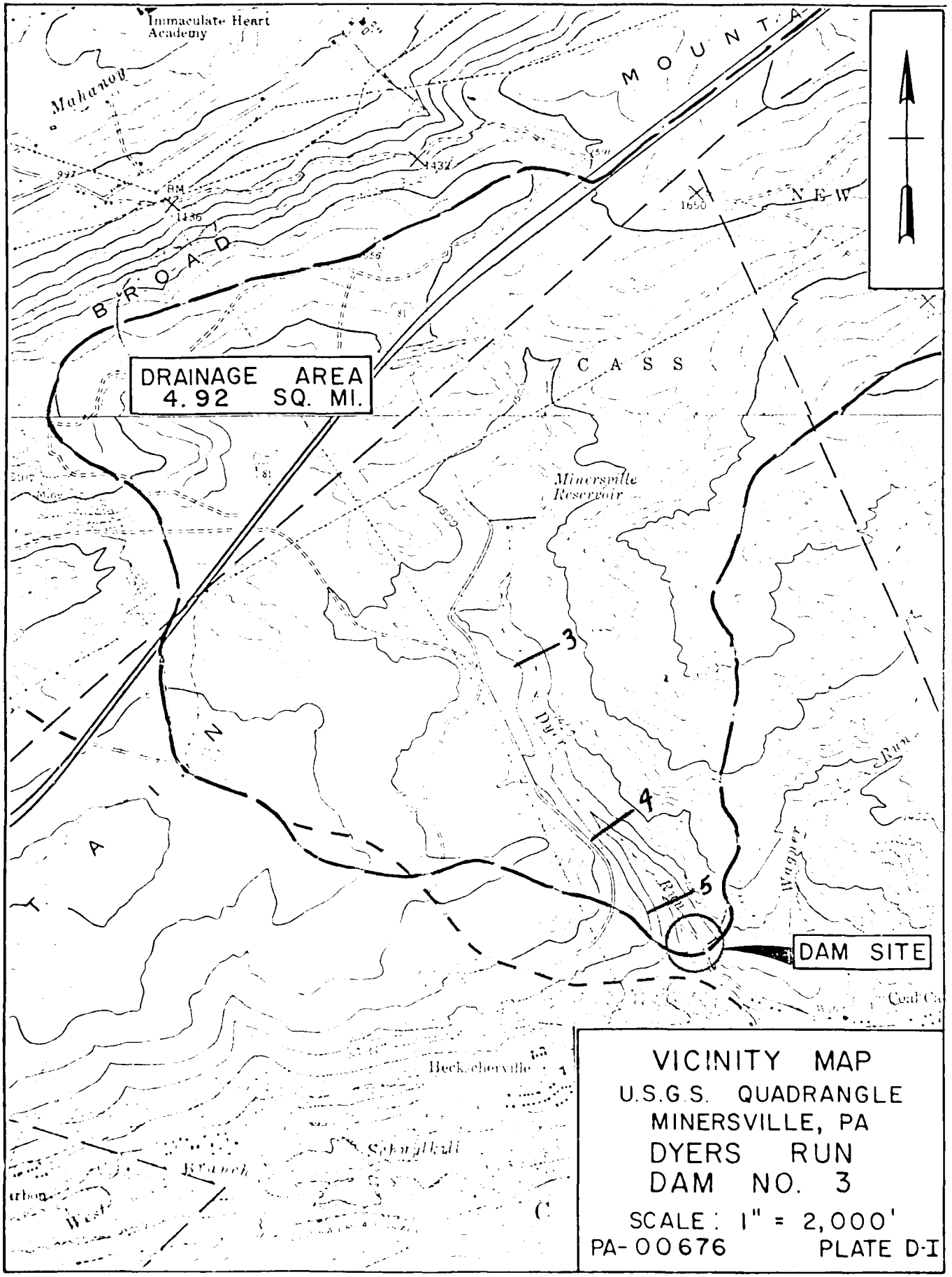
TOP OF DAM ELEV. = 1460

EMBANKMENT C = 2.7

BY KLS DATE ____ **BERGER ASSOCIATES** SHEET NO. 7 OF 7
CHKD. BY ____ DATE ____ PROJECT DAM 90
SUBJECT DUCK RUN DAM #3

SPILLWAY CAPACITY CURVE





VICINITY MAP

U.S.G.S. QUADRANGLE
MINERSVILLE, PA

DYERS RUN
DAM NO. 3

SCALE: 1" = 2,000'

PA-00676 PLATE D-I

TABLE NO. 1

COMPARISON OF WATER SURFACE ELEVATIONS

DYERS RUN NO. 3 DAM

PMF = 9,559 cfs SDF = 4711 cfs

Crest Elevation (Low Point) - 1078 Spillway Elevation - 1075

	STAGE	CREST OF DAM ELEVATION	DEPTH	1750' D/S OF DAM* ELEVATION
A.	At Low Point in Embankment Crest	1078	0	976.9
B.	30% PMF Overtopping No Breach	1080.04	2.04	978.3
C.	30% PMF Overtopping (2 Hour Breach)	1080.03	2.03	978.4
D.	30% PMF Overtopping (6 Hour Breach)	1080.03	2.03	978.3

*Several houses located about 1750 feet downstream of Dyers Run No. 3 Dam. Considered to be damage center.

Condition C: (Time refers to elapsed time after start of storm). Time to reach breach elevation 1080.0 at dam = 42.0 Hours. Water level 1750' downstream prior to breach = 978.3. Duration of breach = 2 Hours. Time for breach to peak 1750' downstream = .75 Hours. Peak elevation 1750' downstream due to breach = 978.4. Rate of increase in water level = 0.1' in 45 Minutes.

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Dyers Run No. 3 Dam RIVER BASIN: Delaware

PROBABLE MAXIMUM PRECIPITATION (PMP) = 22.9 INCHES/24 HOURS[1]

(FOR FOOTNOTES SEE NEXT PAGE)

STATION		1	2	3	4
STATION DESCRIPTION		Reservoir #4	Dam #4	Dyers Run Reservoir #3	Dyers Run Dam #3
DRAINAGE AREA (SQUARE MILES)		2.43		2.49	
CUMULATIVE DRAINAGE AREA (SQUARE MILE)		2.43	2.43	4.92	4.92
ADJUSTMENT OF PMP FOR DRAINAGE AREA (%)[2]	6 HOURS	113		113	
	12 HOURS	123		123	
	24 HOURS	132		132	
	48 HOURS	143		143	
	72 HOURS Zone 6				
SNYDER HYDROGRAPH PARAMETERS	ZONE[3]	6		6	
	C_p / C_t[4]	.40/1.35		.40/1.35	
	L (MILES)[5]	2.35		3.0	
	L_{ca} (MILES)[5]	1.06		1.56	
	$T_p = C_t (L \cdot L_{ca})^{0.3}$ (Hours)	1.78		2.14	
SPILLWAY DATA	CREST LENGTH (FT.)		65		45.5
	FREEBOARD (FT.)		4.8		3
	DISCHARGE COEFFICIENT		3.32		3.3
	EXPONENT		1.5		1.5
	ELEVATION		1455.2		1075
AREA[6] (ACRES)	NORMAL POOL	(1455.2) = 22		(1075) = 2.2	
	ELEV. _____	(1480) = 92		(1080) = 3.5	
	ELEV. _____			(1100) = 5.5	
STORAGE (ACRE-FEET)	NORMAL POOL[7]	196		55.2	
	ELEV. 1428.5[8]	0		(999.7) = 0	
	ELEV. _____[8]				
	ELEV. _____[8]				

(1) Hydrometeorological Report 33 (Figure 1), U.S. Army, Corps of Engineers, 1956.

(2) Hydrometeorological Report 33 (Figure 2), U.S. Army, Corps of Engineers, 1956.

(3) Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).

(4) Snyder's Coefficients.

(5) L = Length of longest water course from outlet to basin divide.

L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

(6) Planimetered area encompased by contour upstream of dam.

(7) PennDER files.

(8) Computed by conic method.

DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

```
A1                  DYER RUN DAM NO. 3  (SAMMY'S DAM)    ****    DYER RUN
A2                  CASS TWP., SCHUYLKILL COUNTY, PA.
A3                  NDI # PA-00676      PA DER # 54-38
B    300      0      15       0       0       0       0       0      -4       0
B1     5
J      1      9       1
J1     1    .75      .5     .25     .15      .1     .07     .05     .02
K              1                                       1
K1                  INFLOW HYDROGRAPH - DAM # 4 SUBAREA
M      1      1    2.43            4.92
P           22.9     113     123     132     143
T                                                       1     .05
W   1.78     .4
X   -1.5   -.05       2
K      1      2                                       1
K1                  RESERVOIR ROUTING - DAM # 4
Y                              1
Y1     1                                             196
$A     0     22      92
$E1428.5  1455.2    1480
$$1455.2     65    3.32     1.5
$D  1460    2.7     1.5     760
K      1      3                                       1
K1                  ROUTING THRU REACH 2 - 3
Y                              1
Y1     1
Y6    .1    .07      .1    1330    1380    2500   .0465
Y7     0   1380      40    1360      95    1340     140    1330     150    1330
Y7   230   1340     300    1360     360    1380
K      1      4                                       1
K1                  ROUTING THRU REACH 3 - 4
Y                              1
Y1     1
Y6    .1    .07      .1    1190    1240    3250   .0286
Y7     0   1240      40    1220      90    1200     160    1190     170    1190
Y7   210   1200     230    1220     250    1240
K      1      5                                       1
K1                  ROUTING THRU REACH 4 - 5
Y                              1
Y1     1
Y6    .1    .07      .1    1090    1140    1700   .0417
Y7     0   1140      50    1120     120    1100     150    1090     160    1090
Y7   200   1100     260    1120     290    1140
K              6                                       1
K1                  INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA
M      1      1    2.49            4.92
P           22.9     113     123     132     143
T                                                       1     .05
W   2.14     .4
X   -1.5   -.05       2
K      2      7                                       1
K1                  COMBINE HYDROGRAPHS AT DAM # 3
K      1      8                                       1
K1                  RESERVOIR ROUTING - THRU DYER RUN DAM # 3
Y                              1
Y1     1                                            55.2      -1
Y4  1075  1075.5    1076  1076.5    1077  1077.5    1078  1078.5    1079  1079.5
Y4  1080    1081    1082  1083.5
Y5     0     38     128     249     393     558     742     969    1359    1947
Y5  2703    4531    6717   10555
$A     0    2.2     3.5     5.5
[illegible]
```

```
                Y6    .1     .07      .1    1090    1140    1700   .0417
   42           Y7     0    1140      50    1120     120    1100     150    1090     160    1090
   43           Y7   200    1100     260    1120     290    1140
   44           K              6                                        1
   45           K1                INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA
   46           M      1       1    2.49            4.92
   47           P           22.9     113     123     132     143
   48           T                                                       1     .05
   49           W   2.14      .4
   50           X   -1.5    -.05       2
1  51           K      2       7                                        1
   52           K1                COMBINE HYDROGRAPHS AT DAM # 3
   53           K      1       8                                        1
   54           K1                RESERVOIR ROUTING - THRU DYER RUN DAM # 3
   55           Y                              1
   56           Y1     1                                            55.2      -1
   57           Y4  1075  1075.5    1076  1076.5    1077  1077.5    1078  1078.5    1079  1079.5
   58           Y4  1080    1081    1082  1083.5
   59           Y5     0      38     128     249     393     558     742     969    1359    1947
   60           Y5  2703    4531    6717   10555
   61           $A     0     2.2     3.5     5.5
   62           $E 999.7    1075    1080    1100
   63           $$  1075
   64           $D  1078
   65           K     99
1                          PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

                                RUNOFF HYDROGRAPH AT          1
                                ROUTE HYDROGRAPH TO           2
                                ROUTE HYDROGRAPH TO           3
                                ROUTE HYDROGRAPH TO           4
                                ROUTE HYDROGRAPH TO           5
                                RUNOFF HYDROGRAPH AT          6
                                COMBINE  2 HYDROGRAPHS AT     7
                                ROUTE HYDROGRAPH TO           8
                                END OF NETWORK


1*********************************
 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSION     JULY 1978
   LAST MODIFICATION  26 FEB 79
 *********************************

 RUN  DATE* 80/11/26.
      TIME* 13.59.58.


                        DYER RUN DAM NO. 3  (SAMMY'S DAM)    ****    DYER RUN
                        CASS TWP., SCHUYLKILL COUNTY, PA.
                        NDI # PA-00676      PA DER # 54-38

                                  JOB SPECIFICATION
                 NQ     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
                300       0      15       0       0       0       0       0      -4       0
                                      JOPER     NWT   LROPT   TRACE
                                          5       0       0       0


                            MULTI-PLAN ANALYSES TO BE PERFORMED
                                NPLAN= 1 NRTIO= 9 LRTIO= 1
                RTIOS=   1.00    .75    .50    .25    .15    .10    .07    .05    .02
```

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SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - DAM # 4 SUBAREA

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.43	0.00	4.92	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.90	113.00	123.00	132.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.78 CP= .40 NTA= 0

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 75 END-OF-PERIOD ORDINATES, LAG= 1.80 HOURS, CP= .40 VOL= 1.00

16.	58.	120.	191.	261.	316.	350.	354.	334.	310.
287.	267.	247.	229.	213.	197.	183.	170.	157.	146.
135.	125.	116.	108.	100.	93.	86.	80.	74.	69.
64.	59.	55.	51.	47.	44.	41.	38.	35.	32.
30.	28.	26.	24.	22.	21.	19.	18.	16.	15.
14.	13.	12.	11.	10.	10.	9.	8.	8.	7.
7.	6.	6.	5.	5.	5.	4.	4.	4.	3.
3.	3.	3.	2.	2.					

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	26.20	23.79	2.41	149383.
										(665.)	(604.)	(61.)	(4230.06)

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HYDROGRAPH ROUTING

RESERVOIR ROUTING - DAM # 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	196.	0

HYDROGRAPH ROUTING

RESERVOIR ROUTING - DAM # 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	196.	0

SURFACE AREA=	0.	22.	92.
CAPACITY=	0.	196.	1510.
ELEVATION=	1429.	1455.	1480.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1455.2	65.0	3.3	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1460.0	2.7	1.5	760.

PEAK OUTFLOW IS 4984. AT TIME 41.75 HOURS

PEAK OUTFLOW IS 3736. AT TIME 41.75 HOURS

PEAK OUTFLOW IS 2430. AT TIME 42.25 HOURS

PEAK OUTFLOW IS 1188. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 706. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 466. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 322. AT TIME 42.75 HOURS

PEAK OUTFLOW IS 227. AT TIME 42.75 HOURS

PEAK OUTFLOW IS 87. AT TIME 43.00 HOURS

HYDROGRAPH ROUTING

ROUTING THRU REACH 2 - 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

ROUTING THRU REACH 2 - 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1330.0	1330.0	2500.	.04650

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1380.00 40.00 1360.00 95.00 1340.00 140.00 1330.00 150.00 1330.00
230.00 1340.00 300.00 1360.00 360.00 1380.00

STORAGE	0.00	3.99	12.96	26.89	45.74	67.86	92.48	119.57	149.15	181.22
	215.77	252.80	292.23	333.68	377.12	422.55	469.97	519.37	570.76	624.14
OUTFLOW	0.00	438.03	2128.41	5648.62	11826.86	22004.81	34905.07	50530.49	68908.49	90082.11
	114104.20	141033.96	171088.02	204198.25	240276.66	279357.90	321480.27	366684.75	415014.27	466513.25
STAGE	1330.00	1332.63	1335.26	1337.89	1340.53	1343.16	1345.79	1348.42	1351.05	1353.68
	1356.32	1358.95	1361.58	1364.21	1366.84	1369.47	1372.11	1374.74	1377.37	1380.00
FLOW	0.00	438.03	2128.41	5648.62	11826.86	22004.81	34905.07	50530.49	68908.49	90082.11
	114104.20	141033.96	171088.02	204198.25	240276.66	279357.90	321480.27	366684.75	415014.27	466513.25

MAXIMUM STAGE IS 1337.4

MAXIMUM STAGE IS 1336.5

MAXIMUM STAGE IS 1335.5

MAXIMUM STAGE IS 1333.8

MAXIMUM STAGE IS 1333.0

MAXIMUM STAGE IS 1332.7

MAXIMUM STAGE IS 1331.9

MAXIMUM STAGE IS 1331.4

MAXIMUM STAGE IS 1330.9

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HYDROGRAPH ROUTING

ROUTING THRU REACH 3 - 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1190.0	1240.0	3250.	.02860

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1240.00 40.00 1220.00 90.00 1200.00 160.00 1190.00 170.00 1190.00
210.00 1200.00 230.00 1220.00 250.00 1240.00

STORAGE	0.00	4.81	15.29	31.47	53.24	78.07	104.71	133.15	163.40	195.46
	229.33	265.01	302.45	341.46	382.02	424.13	467.79	513.00	559.76	608.07
OUTFLOW	0.00	321.39	1526.14	4006.50	8333.67	15405.82	24254.89	34825.47	47087.90	61028.29
	76642.90	93934.96	112957.25	133679.00	156067.56	180128.48	205869.81	233301.49	262434.94	293282.84
STAGE	1190.00	1192.63	1195.26	1197.89	1200.53	1203.16	1205.79	1208.42	1211.05	1213.68
	1216.32	1218.95	1221.58	1224.21	1226.84	1229.47	1232.11	1234.74	1237.37	1240.00
FLOW	0.00	321.39	1526.14	4006.50	8333.67	15405.82	24254.89	34825.47	47087.90	61028.29
	76642.90	93934.96	112957.25	133679.00	156067.56	180128.48	205869.81	233301.49	262434.94	293282.84

MAXIMUM STAGE IS 1198.5

MAXIMUM STAGE IS 1197.6

MAXIMUM STAGE IS 1196.2

MAXIMUM STAGE IS 1194.5

MAXIMUM STAGE IS 1193.5

MAXIMUM STAGE IS 1192.9

AXIMUM STAGE IS 1192.6

MAXIMUM STAGE IS 1191.9

MAXIMUM STAGE IS 1190.7

ROUTING THRU REACH 4 - 5

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1090.0	1140.0	1700.	.04170

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1140.00 50.00 1120.00 120.00 1100.00 150.00 1090.00 160.00 1090.00
200.00 1100.00 260.00 1120.00 290.00 1140.00

STORAGE	0.00	1.97	5.84	11.59	19.24	28.69	39.89	52.85	67.56	84.04
	102.27	122.25	143.87	166.63	190.47	215.39	241.39	268.47	296.63	325.87
OUTFLOW	0.00	317.03	1380.61	3467.64	7016.36	12830.42	20310.46	29551.15	40645.15	53685.19
	68763.70	85972.44	105694.12	127772.60	151996.91	178384.33	206957.59	237743.17	270770.19	306069.69
STAGE	1090.00	1092.63	1095.26	1097.89	1100.53	1103.16	1105.79	1108.42	1111.05	1113.68
	1116.32	1118.95	1121.58	1124.21	1126.84	1129.47	1132.11	1134.74	1137.37	1140.00
FLOW	0.00	317.03	1380.61	3467.64	7016.36	12830.42	20310.46	29551.15	40645.15	53685.19
	68763.70	85972.44	105694.12	127772.60	151996.91	178384.33	206957.59	237743.17	270770.19	306069.69

MAXIMUM STAGE IS 1099.0

MAXIMUM STAGE IS 1098.1

MAXIMUM STAGE IS 1096.6

MAXIMUM STAGE IS 1094.8

MAXIMUM STAGE IS 1093.6

MAXIMUM STAGE IS 1093.0

MAXIMUM STAGE IS 1092.6

MAXIMUM STAGE IS 1091.9

XIMUM STAGE IS 1090.7

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SUB-AREA RUNOFF COMPUTATION

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SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.49	0.00	4.92	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.90	113.00	123.00	132.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 2.14 CP= .40 NTA= 0

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 90 END-OF-PERIOD ORDINATES, LAG= 2.13 HOURS, CP= .40 VOL= 1.00

11.	40.	81.	131.	184.	234.	273.	298.	306.	295.
277.	260.	245.	230.	216.	203.	190.	179.	168.	158.
148.	139.	131.	123.	115.	108.	102.	96.	90.	84.
79.	75.	70.	66.	62.	58.	55.	51.	48.	45.
42.	40.	37.	35.	33.	31.	29.	27.	26.	24.
23.	21.	20.	19.	18.	17.	16.	15.	14.	13.
12.	11.	11.	10.	9.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	5.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	2.	2.	2.	2.

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	26.20	23.79	2.41	152539.
										(665.)	(604.)	(61.)	(4320.84)

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COMBINE HYDROGRAPHS

COMBINE HYDROGRAPHS AT DAM # 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
7	2	0	0	0	0	1	0	0

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HYDROGRAPH ROUTING

RECESSION ROUTING - THRU DYER RUN DAM # 3

RESERVOIR ROUTING - THRU DYER RUN DAM # 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	55.	-1

STAGE	1075.00	1075.50	1076.00	1076.50	1077.00	1077.50	1078.00	1078.50	1079.00	1079.50
	1080.00	1081.00	1082.00	1083.50						
FLOW	0.00	38.00	128.00	249.00	393.00	558.00	742.00	969.00	1359.00	1947.00
	2703.00	4531.00	6717.00	10555.00						
SURFACE AREA=	0.	2.	4.	6.						
CAPACITY=	0.	55.	69.	159.						
ELEVATION=	1000.	1075.	1080.	1100.						

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1075.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1078.0	0.0	0.0	0.

PEAK OUTFLOW IS 9564. AT TIME 42.00 HOURS

PEAK OUTFLOW IS 7175. AT TIME 42.00 HOURS

PEAK OUTFLOW IS 4710. AT TIME 42.25 HOURS

PEAK OUTFLOW IS 2311. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 1377. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 910. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 628. AT TIME 42.75 HOURS

PEAK OUTFLOW IS 444. AT TIME 42.75 HOURS

PEAK OUTFLOW IS 171. AT TIME 43.00 HOURS

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1

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .75	RATIO 3 .50	RATIO 4 .25	RATIO 5 .15	RATIO 6 .10	RATIO 7 .07	RATIO 8 .05	RATIO 9 .02
HYDROGRAPH AT	1	2.43	1	4995.	3746.	2497.	1249.	749.	499.	350.	250.	100.
	(	6.29)	(	141.44)(	106.08)(	70.72)(	35.36)(	21.22)(	14.14)(	9.90)(	7.07)(	2.83)
ROUTED TO	2	2.43	1	4984.	3736.	2490.	1188.	706.	466.	322.	227.	87.
	(	6.29)	(	141.13)(	105.80)(	68.82)(	33.63)(	20.00)(	13.19)(	9.13)(	6.44)(	2.45)
ROUTED TO	3	2.43	1	4986.	3737.	2436.	1188.	706.	466.	322.	227.	86.
	(	6.29)	(	141.19)(	105.83)(	68.99)(	33.65)(	19.99)(	13.19)(	9.13)(	6.43)(	2.45)
ROUTED TO	4	2.43	1	4983.	3726.	2434.	1187.	705.	465.	321.	227.	86.
	(	6.29)	(	141.10)(	105.50)(	68.93)(	33.60)(	19.97)(	13.18)(	9.10)(	6.42)(	2.44)
ROUTED TO	5	2.43	1	4979.	3730.	2432.	1186.	705.	465.	321.	226.	86.
	(	6.29)	(	140.99)(	105.61)(	68.88)(	33.57)(	19.97)(	13.18)(	9.10)(	6.41)(	2.44)
HYDROGRAPH AT	6	2.49	1	4592.	3444.	2296.	1148.	689.	459.	321.	230.	92.
	(	6.45)	(	130.04)(	97.53)(	65.02)(	32.51)(	19.51)(	13.00)(	9.10)(	6.50)(	2.60)
2 COMBINED	7	4.92	1	9559.	7174.	4711.	2312.	1377.	912.	628.	444.	171.
	(	12.74)	(	270.69)(	203.14)(	133.41)(	65.46)(	39.00)(	25.82)(	17.77)(	12.57)(	4.84)
ROUTED TO	8	4.92	1	9564.	7175.	4710.	2311.	1377.	910.	628.	444.	171.
	(	12.74)	(	270.84)(	203.17)(	133.36)(	65.45)(	39.01)(	25.77)(	17.78)(	12.57)(	4.84)

1 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1455.20	1455.20	1460.00
STORAGE	196.	196.	324.
OUTFLOW	0.	0.	2269.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1460.98	.98	356.	4984.	5.75	41.75	0.00
.75	1460.62	.62	344.	3736.	4.00	41.75	0.00
.50	1460.11	.11	328.	2430.	1.50	42.25	0.00
.25	1458.32	0.00	274.	1168.	0.00	42.50	0.00
.15	1457.40	0.00	249.	706.	0.00	42.50	0.00
.10	1456.87	0.00	235.	466.	0.00	42.50	0.00
.07	1456.51	0.00	226.	322.	0.00	42.75	0.00
.05	1456.24	0.00	220.	227.	0.00	42.75	0.00
.02	1455.74	0.00	208.	87.	0.00	43.00	0.00

PLAN 1 STATION 3

1.00	4986.	1337.4	41.75
.75	3737.	1336.5	41.75
.50	2436.	1335.5	42.25
.25	1189.	1333.8	42.50
.15	706.	1333.0	42.50
.10	466.	1332.7	42.75
.07	322.	1331.9	42.75
.05	227.	1331.4	42.75
.02	86.	1330.5	43.25

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	4983.	1198.5	41.75
.75	3726.	1197.6	41.75
.50	2434.	1196.2	42.25
.25	1187.	1194.5	42.50
.15	705.	1193.5	42.75
.10	465.	1192.9	42.75
.07	321.	1192.6	43.00
.05	227.	1191.9	43.00
.02	86.	1190.7	43.25

PLAN 1 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	4979.	1099.0	41.75
.75	3730.	1098.1	42.00
.50	2432.	1096.6	42.25
.25	1186.	1094.8	42.50
.15	705.	1093.6	42.75
.10	465.	1093.0	42.75
.07	321.	1092.6	43.00
.05	226.	1091.9	43.25
.02	86.	1090.7	43.50

1 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1074.97	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1083.11	5.11	81.	9564.	16.50	42.00	0.00
.75	1082.18	4.18	77.	7175.	15.00	42.00	0.00
.50	1081.08	3.08	73.	4710.	12.75	42.25	0.00
.25	1079.74	1.74	68.	2311.	8.75	42.50	0.00
.15	1079.02	1.02	66.	1377.	5.75	42.50	0.00
.10	1078.37	.37	64.	910.	3.00	42.50	0.00
.07	1077.69	0.00	62.	628.	0.00	42.75	0.00
.05	1077.15	0.00	61.	444.	0.00	42.75	0.00
.02	1076.13	0.00	58.	171.	0.00	43.00	0.00

```
 ...ETT VERSION    JULY 1978
 LAST MODIFICATION  26 FEB 79
**********************************
    1          A1                  DYER RUN DAM NO. 3  (SAMMY'S DAM)    ****    DYER RUN
    2          A2                  CASS TWP., SCHUYLKILL COUNTY, PA.
    3          A3                  NDI # PA-00676      PA DER # 54-36
    4          B    300       0      15       0       0       0       0       0      -4       0
    5          B1     5
    6          J      4       1       1
    7          J1    .3
    8          K                    1                                       1
    9          K1                  INFLOW HYDROGRAPH - DAM # 4 SUBAREA
   10          M      1       1    2.43            4.92                                    1
   11          P             22.9    113     123     132     143
   12          T                                                           1     .05
   13          W   1.78      .4
   14          X   -1.5     -.05      2
   15          K      1       2                                            1
   16          K1                  RESERVOIR ROUTING - DAM # 4
   17          Y                                   1       1
   18          Y1     1                                                  196
   19          $A     0      22      92
   20          $E1428.5  1455.2    1480
   21          $$1455.2      65    3.32     1.5
   22          $D  1460     2.7     1.5     760
   23          K      1       3                                            1
   24          K1                  ROUTING THRU REACH 2 - 3
   25          Y                                   1       1
   26          Y1     1
   27          Y6    .1     .07      .1    1330    1380    2500   .0465
   28          Y7     0    1380      40    1360      95    1340     140    1330     150    1330
   29          Y7   230    1340     300    1360     360    1380
   30          K      1       4                                            1
   31          K1                  ROUTING THRU REACH 3 - 4
   32          Y                                   1       1
   33          Y1     1
   34          Y6    .1     .07      .1    1190    1240    3250   .0286
   35          Y7     0    1240      40    1220      90    1200     160    1190     170    1190
   36          Y7   210    1200     230    1220     250    1240
   37          K      1       5                                            1
   38          K1                  ROUTING THRU REACH 4 - 5
   39          Y                                   1       1
   40          Y1     1
   41          Y6    .1     .07      .1    1090    1140    1700   .0417
   42          Y7     0    1140      50    1120     120    1100     150    1090     160    1090
   43          Y7   200    1100     260    1120     290    1140
   44          K                    6                                       1
   45          K1                  INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA
   46          M      1       1    2.49            4.92                                    1
   47          P             22.9    113     123     132     143
   48          T                                                           1     .05
   49          W   2.14      .4
   50          X   -1.5     -.05      2
1  51          K      2       7                                            1
   52          K1                  COMBINE HYDROGRAPHS AT DAM # 3
   53          K      1       8                                            1
   54          K1                  RESERVOIR ROUTING - THRU DYER RUN DAM # 3
   55          Y                                   1       1
   56          Y1     1                                                         55.2      -1
   57          Y4  1075  1075.5    1076  1076.5    1077  1077.5    1078  1078.5    1079  1079.5
   58          Y4  1080    1081    1082  1083.5
   59          Y5     0      38     128     249     393     553     742     969    1359    1947
   60          Y5  2703    4531    6717   10555
   61          $A     0     2.2     3.5     5.5
```

```
K1                RESERVOIR ROUTING - THRU DYER RUN DAM # 3
Y                                  1       1
Y1     1                                                  55.2      -1
Y4  1075  1075.5    1076  1076.5    1077  1077.5    1078  1078.5    1079  1079.5
Y4  1080    1081    1082  1083.5
Y5     0      38     128     249     393     558     742     969    1359    1947
Y5  2703    4531    6717   10555
$A     0     2.2     3.5     5.5
$E 999.7    1075    1080    1100
$$  1075
$D  1078
$B    50       1    1060       2    1075    1100
$B    50       1    1060       2    1075    1080
$B    50       1    1060       4    1075    1080
$B    50       1    1060       6    1075    1080
K      1       9                                          1
K1                ROUTING THRU REACH 8 - 9
Y                                  1       1
Y1     1
Y6    .1     .07      .1     975    1020    1750    .025
Y7     0    1020     100    1000     200     980     240     975     250     975
Y7   600     980    1050    1000    1200    1020
K     99
1                 PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

                        RUNOFF HYDROGRAPH AT          1
                        ROUTE HYDROGRAPH TO           2
                        ROUTE HYDROGRAPH TO           3
                        ROUTE HYDROGRAPH TO           4
                        ROUTE HYDROGRAPH TO           5
                        RUNOFF HYDROGRAPH AT          6
                        COMBINE  2 HYDROGRAPHS AT     7
                        ROUTE HYDROGRAPH TO           8
                        ROUTE HYDROGRAPH TO           9
                        END OF NETWORK


1*******************************
 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSION     JULY 1978
   LAST MODIFICATION  26 FEB 79
 *******************************

 RUN  DATE* 80/12/03.
      TIME* 08.16.53.


                    DYER RUN DAM NO. 3  (SAMMY'S DAM)    ****    DYER RUN
                    CASS TWP., SCHUYLKILL COUNTY, PA.
                    NDI # PA-00676      PA DER # 54-33

                                JOB SPECIFICATION
          NQ     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
         300       0      15       0       0       0       0       0      -4       0
                                JOPER     NWT   LROPT   TRACE
                                    5       0       0       0


                        MULTI-PLAN ANALYSES TO BE PERFORMED
                            NPLAN= 4 NRTIO= 1 LRTIO= 1
          RTIOS=    .30
```

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - DAM # 4 SUBAREA

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.43	0.00	4.92	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.90	113.00	123.00	132.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.78 CP= .40 NTA= 0

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 75 END-OF-PERIOD ORDINATES, LAG= 1.80 HOURS, CP= .40 VOL= 1.00

16.	58.	120.	191.	261.	316.	350.	354.	334.	310.
287.	267.	247.	229.	213.	197.	183.	170.	157.	146.
135.	125.	116.	108.	100.	93.	86.	80.	74.	69.
64.	59.	55.	51.	47.	44.	41.	38.	35.	32.
30.	28.	26.	24.	22.	21.	19.	18.	16.	15.
14.	13.	12.	11.	10.	10.	9.	8.	8.	7.
7.	6.	6.	5.	5.	5.	4.	4.	4.	3.
3.	3.	3.	2.	2.					

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

SUM	26.20	23.79	2.41	149383.		
	(665.)	(604.)	(61.)	(4230.06)		

HYDROGRAPH ROUTING

RESERVOIR ROUTING - DAM # 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	196.	0

HYDROGRAPH ROUTING

RESERVOIR ROUTING - DAM # 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	196.	0

SURFACE AREA=	0.	22.	92.
CAPACITY=	0.	196.	1510.
ELEVATION=	1429.	1455.	1480.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1455.2	65.0	3.3	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1460.0	2.7	1.5	760.

PEAK OUTFLOW IS 1428. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 1428. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 1428. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 1428. AT TIME 42.50 HOURS

HYDROGRAPH ROUTING

ROUTING THRU REACH 2 - 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

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HYDROGRAPH ROUTING

ROUTING THRU REACH 2 - 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1330.0	1380.0	2500.	.04650

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1380.00 40.00 1360.00 95.00 1340.00 140.00 1330.00 150.00 1330.00
230.00 1340.00 300.00 1360.00 360.00 1380.00

STORAGE	0.00	3.99	12.96	26.89	45.74	67.86	92.48	119.57	149.15	181.2
	215.77	252.80	292.23	333.68	377.12	422.55	469.97	519.37	570.76	624.1
OUTFLOW	0.00	438.03	2128.41	5648.62	11826.86	22004.81	34905.07	50530.49	68913.49	90082.1
	114104.20	141033.96	171088.02	204198.25	240276.66	279357.90	321480.27	366684.75	415014.27	466513.2
STAGE	1330.00	1332.63	1335.26	1337.89	1340.53	1343.16	1345.79	1348.42	1351.05	1353.6
	1356.32	1358.95	1361.58	1364.21	1366.84	1369.47	1372.11	1374.74	1377.37	1380.0
FLOW	0.00	438.03	2128.41	5648.62	11826.86	22004.81	34905.07	50530.49	68913.49	90082.1
	114104.20	141033.96	171088.02	204198.25	240276.66	279357.90	321480.27	366684.75	415014.27	466513.2

MAXIMUM STAGE IS 1334.2

MAXIMUM STAGE IS 1334.2

MAXIMUM STAGE IS 1334.2

MAXIMUM STAGE IS 1334.2

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HYDROGRAPH ROUTING

ROUTING THRU REACH 3 - 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

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HYDROGRAPH ROUTING

ROUTING THRU REACH 3 - 4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
4	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	ICPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1190.0	1240.0	3250.	.02860

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1240.00 40.00 1220.00 90.00 1200.00 160.00 1190.00 170.00 1190.00
210.00 1200.00 230.00 1220.00 250.00 1240.00

STORAGE	0.00	4.81	15.29	31.47	53.24	78.07	104.71	133.15	163.40	195.46
	229.33	265.01	302.45	341.46	382.02	424.13	467.79	513.00	559.76	608.07
OUTFLOW	0.00	321.39	1526.14	4006.50	8333.67	15405.82	24254.89	34825.47	47087.90	61028.29
	76642.90	93934.96	112957.25	133679.00	156067.56	180128.48	205869.81	233301.49	262434.94	293282.84
STAGE	1190.00	1192.63	1195.26	1197.89	1200.53	1203.16	1205.79	1208.42	1211.05	1213.68
	1216.32	1218.95	1221.58	1224.21	1226.84	1229.47	1232.11	1234.74	1237.37	1240.00
FLOW	0.00	321.39	1526.14	4006.50	8333.67	15405.82	24254.89	34825.47	47087.90	61028.29
	76642.90	93934.96	112957.25	133679.00	156067.56	180128.48	205869.81	233301.49	262434.94	293282.84

MAXIMUM STAGE IS 1195.0

MAXIMUM STAGE IS 1195.0

MAXIMUM STAGE IS 1195.0

MAXIMUM STAGE IS 1195.0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTING THRU REACH 4 - 5

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0

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HYDROGRAPH ROUTING

ROUTING THRU REACH 4 - 5

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
5	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPHP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	1090.0	1140.0	1700.	.04170

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1140.00 50.00 1120.00 120.00 1100.00 150.00 1090.00 160.00 1090.00
200.00 1100.00 260.00 1120.00 290.00 1140.00

STORAGE	0.00	1.97	5.84	11.59	19.24	28.69	39.89	52.85	67.56	84.04
	102.27	122.25	143.87	166.63	190.47	215.39	241.39	268.47	296.63	325.87
OUTFLOW	0.00	317.03	1380.61	3467.64	7016.36	12830.42	20310.46	29551.15	40645.15	53685.19
	68763.70	85972.44	105694.12	127772.60	151996.91	178384.33	206957.59	237743.17	270770.19	306069.69
STAGE	1090.00	1092.63	1095.26	1097.89	1100.53	1103.16	1105.79	1108.42	1111.05	1113.68
	1116.32	1118.95	1121.58	1124.21	1126.84	1129.47	1132.11	1134.74	1137.37	1140.00
FLOW	0.00	317.03	1380.61	3467.64	7016.36	12830.42	20310.46	29551.15	40645.15	53685.19
	68763.70	85972.44	105694.12	127772.60	151996.91	178384.33	206957.59	237743.17	270770.19	306069.69

MAXIMUM STAGE IS 1095.3

MAXIMUM STAGE IS 1095.3

MAXIMUM STAGE IS 1095.3

MAXIMUM STAGE IS 1095.3

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SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	0	0	1	0	0

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SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - DYER RUN DAM # 3 SUBAREA

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.49	0.00	4.92	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.90	113.00	123.00	132.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 2.14 CP= .40 NTA= 0

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 90 END-OF-PERIOD ORDINATES, LAG= 2.13 HOURS, CP= .40 VOL= 1.00

11.	40.	81.	131.	184.	234.	273.	298.	306.	295.
277.	260.	245.	230.	216.	203.	190.	179.	168.	158.
148.	139.	131.	123.	115.	108.	102.	96.	90.	84.
79.	75.	70.	66.	62.	58.	55.	51.	48.	45.
42.	40.	37.	35.	33.	31.	29.	27.	26.	24.
23.	21.	20.	19.	18.	17.	16.	15.	14.	13.
12.	11.	11.	10.	9.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	5.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	2.	2.	2.	2.

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

SUM	26.20	23.79	2.41	152539.
	(665.)	(604.)	(61.)	(4320.84)

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COMBINE HYDROGRAPHS

COMBINE HYDROGRAPHS AT DAM # 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
7	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

HYDROGRAPH ROUTING

RESERVOIR ROUTING - THRU DYER RUN DAM # 3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	55.	-1

STAGE	1075.00	1075.50	1076.00	1076.50	1077.00	1077.50	1078.00	1078.50	1079.00	1079.50
	1080.00	1081.00	1082.00	1083.50						
FLOW	0.00	38.00	128.00	249.00	393.00	558.00	742.00	969.00	1359.00	1947.00
	2703.00	4531.00	6717.00	10555.00						
SURFACE AREA=	0.	2.	4.	6.						
CAPACITY=	0.	55.	69.	159.						
ELEVATION=	1000.	1075.	1080.	1100.						

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1075.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1078.0	0.0	0.0	0.

DAM IBREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
50.	1.00	1060.00	2.00	1075.00	1100.00

PEAK OUTFLOW IS 2780. AT TIME 42.25 HOURS

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
50.	1.00	1060.00	2.00	1075.00	1080.00

BEGIN DAM FAILURE AT 42.00 HOURS

PEAK OUTFLOW IS 3061. AT TIME 42.04 HOURS

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
50.	1.00	1060.00	4.00	1075.00	1080.00

BEGIN DAM FAILURE AT 42.00 HOURS

PEAK OUTFLOW IS 2967. AT TIME 42.08 HOURS

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
50.	1.00	1060.00	6.00	1075.00	1080.00

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
50.	1.00	1060.00	6.00	1075.00	1080.00

BEGIN DAM FAILURE AT 42.00 HOURS

PEAK OUTFLOW IS 2921. AT TIME 42.13 HOURS

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTING THRU REACH 8 - 9

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
9	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0700	.1000	975.0	1020.0	1750.	.02500

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 1020.00 100.00 1000.00 200.00 980.00 240.00 975.00 250.00 975.00
600.00 980.00 1050.00 1000.00 1200.00 1020.00

STORAGE	0.00	9.74	37.06	77.46	124.13	176.99	236.05	301.31	372.77	450.43
	534.27	623.99	717.04	812.91	911.60	1013.10	1117.42	1224.56	1334.51	1447.28
OUTFLOW	0.00	943.82	5609.38	17688.90	35866.94	59810.01	89559.53	125227.65	166960.22	214926.71
	269306.78	331410.08	401438.46	477845.41	560568.80	649571.05	744832.68	846343.09	954122.44	1067218.01
STAGE	975.00	977.37	979.74	982.11	984.47	986.84	989.21	991.58	993.95	996.32
	998.68	1001.05	1003.42	1005.79	1008.16	1010.53	1012.89	1015.26	1017.63	1020.00
FLOW	0.00	943.82	5609.38	17688.90	35866.94	59810.01	89559.53	125227.65	166960.22	214926.71
	269306.78	331410.08	401438.46	477845.41	560568.80	649571.05	744832.68	846343.09	954122.44	1067218.01

MAXIMUM STAGE IS 978.3

MAXIMUM STAGE IS 978.4

MAXIMUM STAGE IS 978.3

MAXIMUM STAGE IS 978.3

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .30
HYDROGRAPH AT	1	2.43	1	1498.
	(	6.29)	(	42.43)(
			2	1498.
			(	42.43)(
			3	1498.
			(	42.43)(
			4	1498.
			(	42.43)(
ROUTED TO	2	2.43	1	1428.
	(	6.29)	(	40.45)(
			2	1428.
			(	40.45)(
			3	1428.
			(	40.45)(
			4	1428.
			(	40.45)(
ROUTED TO	3	2.43	1	1429.
	(	6.29)	(	40.47)(
			2	1429.
			(	40.47)(
			3	1429.
			(	40.47)(
			4	1429.
			(	40.47)(
ROUTED TO	4	2.43	1	1428.
	(	6.29)	(	40.44)(
			2	1428.
			(	40.44)(
			3	1428.
			(	40.44)(
			4	1428.
			(	40.44)(
ROUTED TO	5	2.43	1	1427.
	(	6.29)	(	40.41)(
			2	1427.
			(	40.41)(
			3	1427.
			(	40.41)(
			4	1427.
			(	40.41)(
HYDROGRAPH AT	6	2.49	1	1378.
	(	6.45)	(	39.01)(
			2	1378.
			(	39.01)(

HYDROGRAPH AT	6	2.49	1	1378.
	(	6.45)	(	39.01)(
			2	1378.
			(	39.01)(
			3	1378.
			(	39.01)(
			4	1378.
			(	39.01)(
2 COMBINED	7	4.92	1	2782.
	(	12.74)	(	78.79)(
			2	2782.
			(	78.79)(
			3	2782.
			(	78.79)(
			4	2782.
			(	78.79)(
ROUTED TO	8	4.92	1	2780.
	(	12.74)	(	78.73)(
			2	2952.
			(	83.58)(
			3	2836.
			(	80.30)(
			4	2788.
			(	78.93)(
ROUTED TO	9	4.92	1	2780.
	(	12.74)	(	78.73)(
			2	2942.
			(	83.30)(
			3	2838.
			(	80.36)(
			4	2788.
			(	78.96)(

1 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1455.20	1455.20	1480.00
STORAGE	196.	196.	324.
OUTFLOW	0.	0.	2269.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1458.73	0.00	285.	1429.	0.00	42.50	0.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1455.20	1455.20	1480.00
STORAGE	196.	196.	324.
OUTFLOW	0.	0.	2269.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS

.30	1458.73	0.00	285.	1428.	0.00	42.50	0.00

PLAN 3 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1455.20	1455.20	1460.00
STORAGE	196.	196.	324.
OUTFLOW	0.	0.	2269.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1458.73	0.00	285.	1428.	0.00	42.50	0.00

PLAN 4 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1455.20	1455.20	1460.00
STORAGE	196.	196.	324.
OUTFLOW	0.	0.	2269.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1458.73	0.00	285.	1428.	0.00	42.50	0.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1429.	1334.2	42.50

PLAN 2 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1429.	1334.2	42.50

PLAN 3 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1429.	1334.2	42.50

PLAN 4 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1429.	1334.2	42.50

PLAN 1 STATION 4

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1428.	1195.0	42.50

PLAN 2 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1423.	1195.0	42.50

PLAN 3 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1428.	1195.0	42.50

PLAN 4 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1428.	1195.0	42.50

PLAN 1 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1427.	1095.3	42.50

PLAN 2 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1427.	1095.3	42.50

PLAN 3 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1427.	1095.3	42.50

PLAN 4 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS

PLAN 4 STATION 5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	1427.	1095.3	42.50

1 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1075.00	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1080.04	2.04	69.	2780.	10.00	42.25	0.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1075.00	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1080.03	2.03	69.	3061.	3.83	42.04	42.00

PLAN 3 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1075.00	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1080.03	2.03	69.	2967.	4.42	42.08	42.00

PLAN 4 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1075.00	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1080.03	2.03	69.	2921.	4.88	42.13	42.00

PLAN 1 STATION 9

PLAN 4 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1075.00	1075.00	1078.00
STORAGE	55.	55.	63.
OUTFLOW	0.	0.	742.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.30	1080.03	2.03	69.	2921.	4.88	42.13	42.00

PLAN 1 STATION 9

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	2780.	978.3	42.50

PLAN 2 STATION 9

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	2942.	978.4	42.75

PLAN 3 STATION 9

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	2838.	978.3	42.50

PLAN 4 STATION 9

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.30	2788.	978.3	42.75

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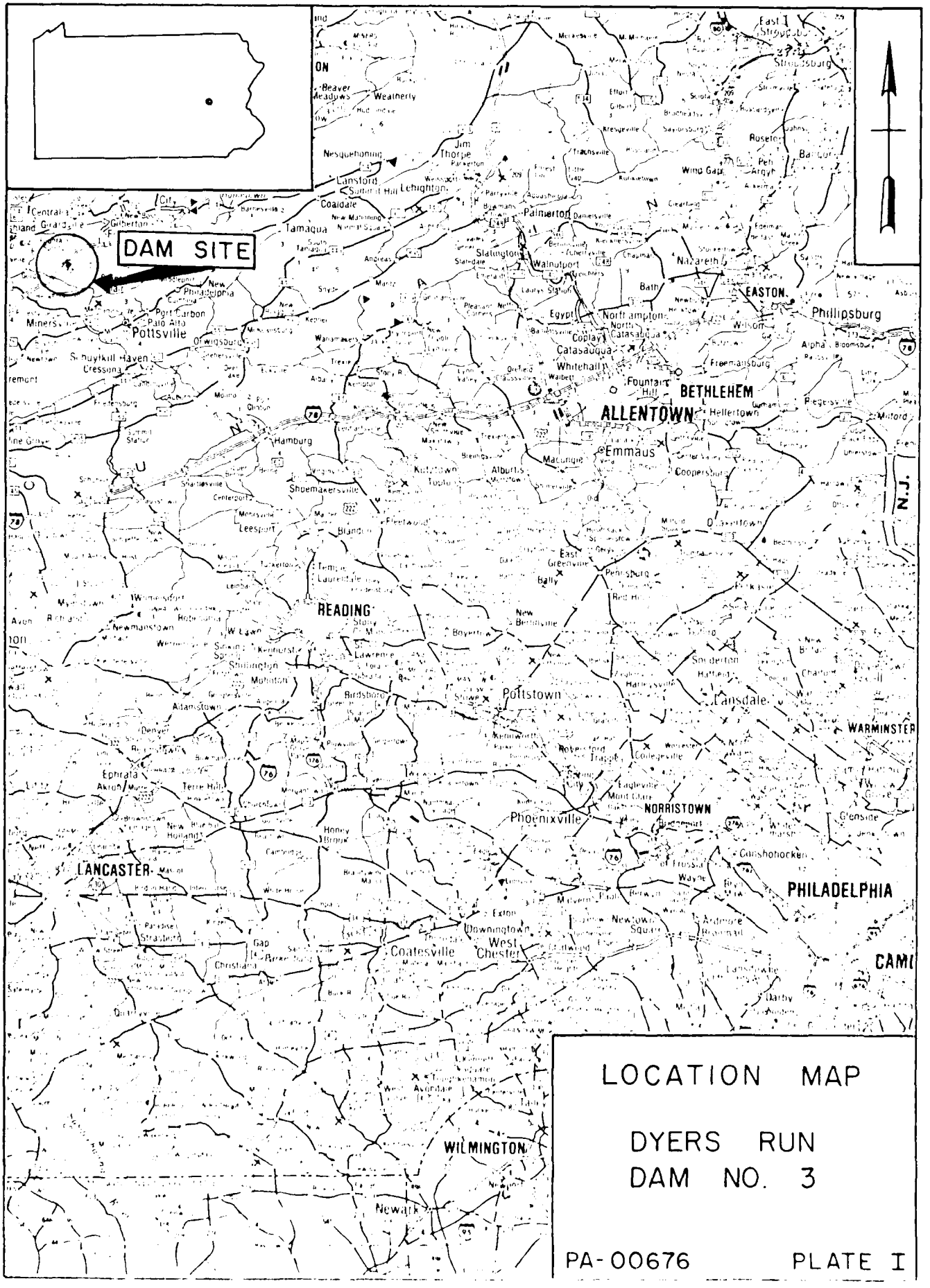
APPENDIX E

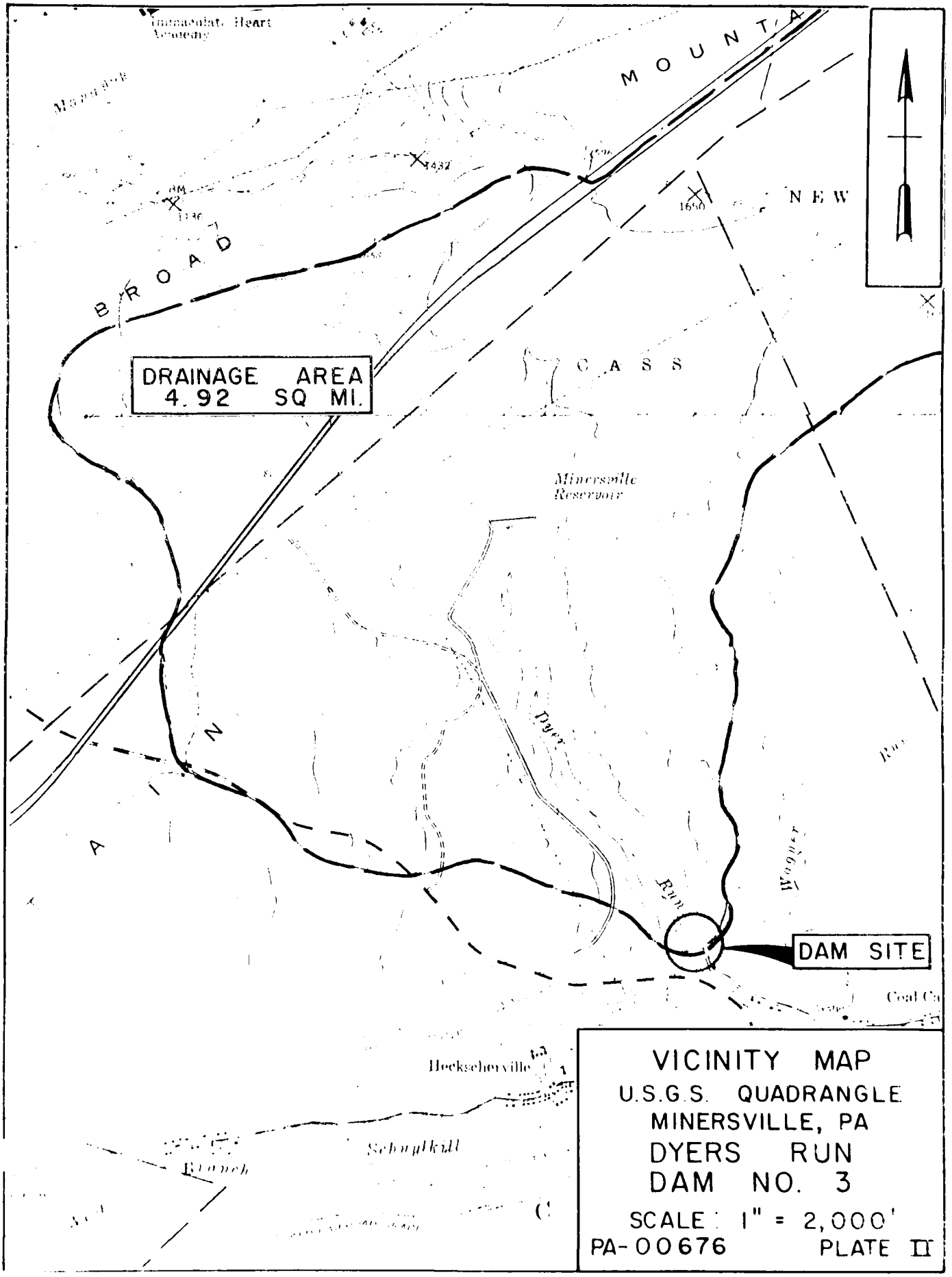
PLATES



LOCATION MAP

DYERS RUN
DAM NO. 3

PA-00676 PLATE I



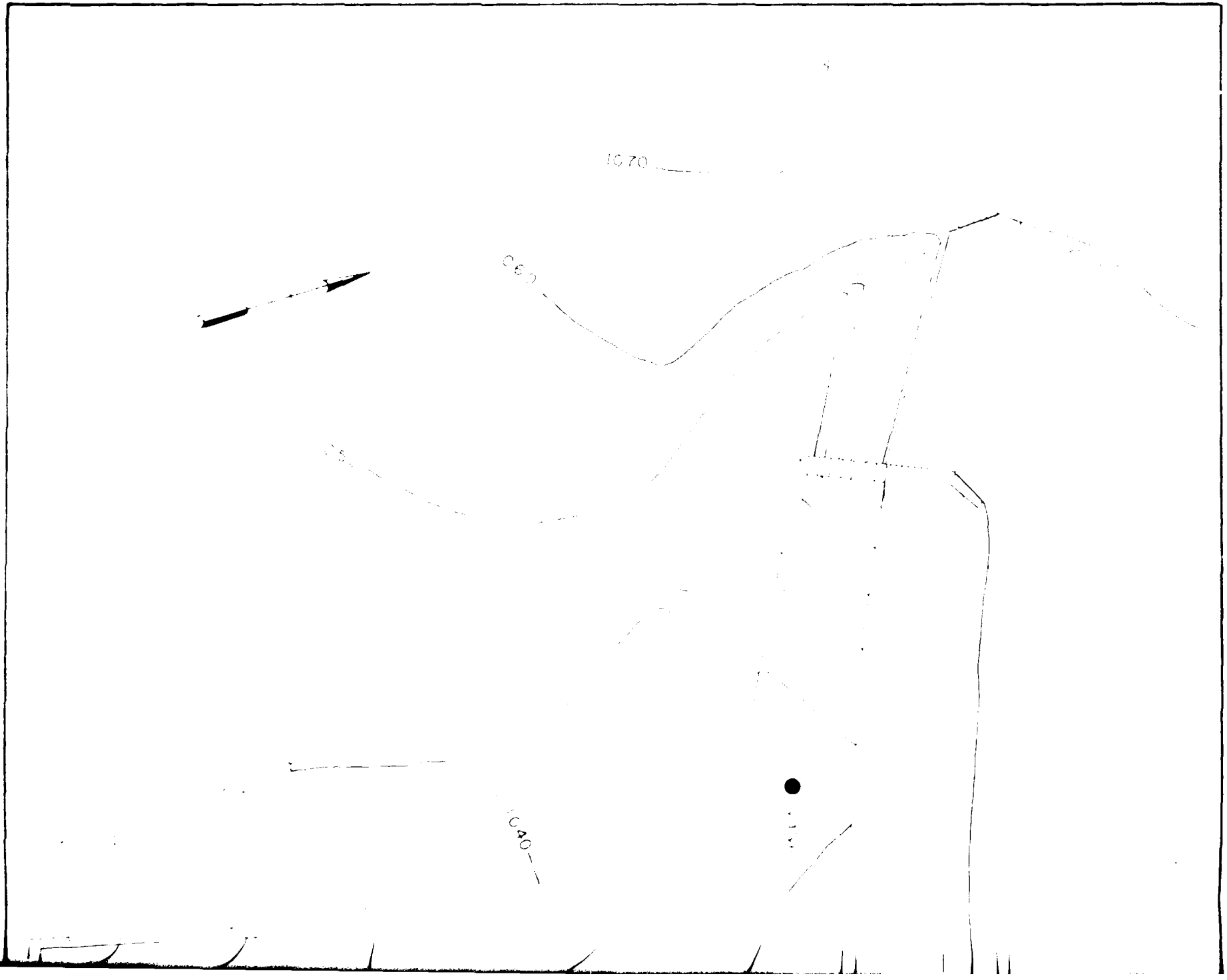
VICINITY MAP

U.S.G.S. QUADRANGLE
MINERSVILLE, PA

DYERS RUN
DAM NO. 3

SCALE: 1" = 2,000'

PA-00676 PLATE II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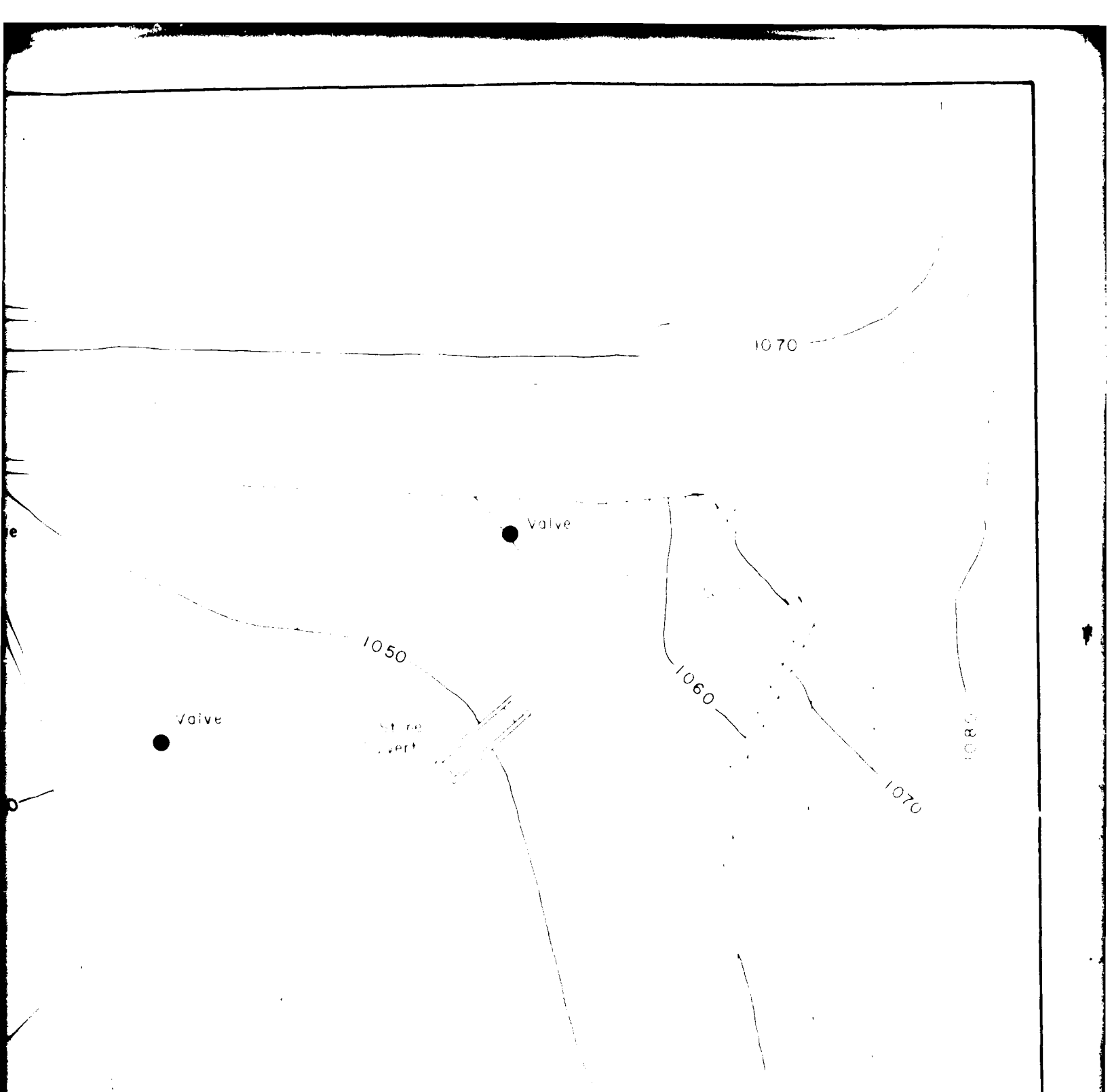


DYERS RUN DAM No 3

PA 00676

PLATE III

APPENDIX F

GEOLOGIC REPORT

BEDROCK - DAM AND RESERVOIR

This area overlies the Schuylkill member of the Pottsville group. The Pottsville group consists of light gray to white, coarse sandstones and conglomerates, with some mineable coals, shales, siltstones, limestones and underclays.

STRUCTURE

Joints are moderately well formed in regular patterns in this group. Faulting is common and important, although there were no apparent faults encountered in the dam and reservoir area.

OVERBURDEN

The overburden in this area most probably consists of residual soils.

AQUIFER CHARACTERISTICS

The aquifer characteristics of this formation are variable, depending on the lithology. The sandstones have a high to medium effective porosity and are a good source of groundwater. The other rock types have a low effective porosity. The possibility of subsurface seepage exists, but its extent depends on the localized lithology.

DISCUSSION

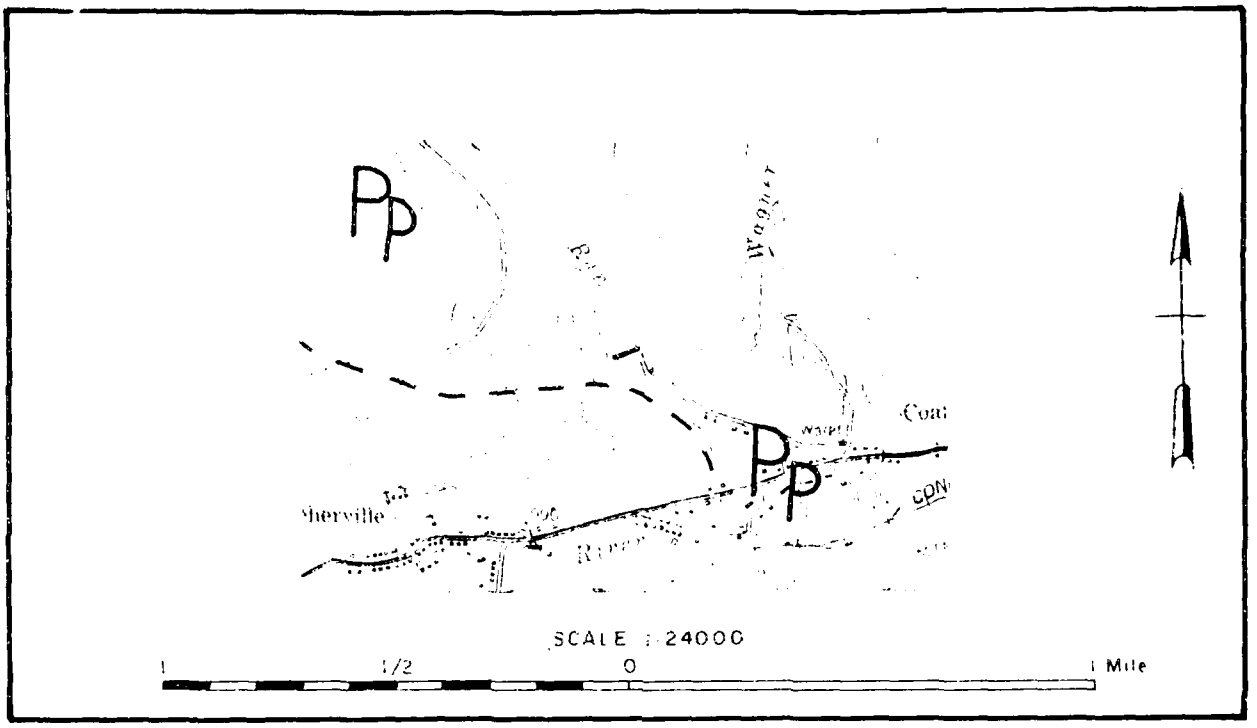
There are no construction plans available to determine whether or not the dam cutoff trench was excavated to bedrock. However, the Pottsville group provides a good to excellent foundation for heavy structures. Test borings drilled in 1971 and visual observations of exposed rock during this inspection confirm the rock types in this area.

SOURCES OF INFORMATION

McGlade, W.G., et. al., 1972. Engineering Characteristics of the Rocks of Pennsylvania: Pennsylvania Geological Survey EG-1.

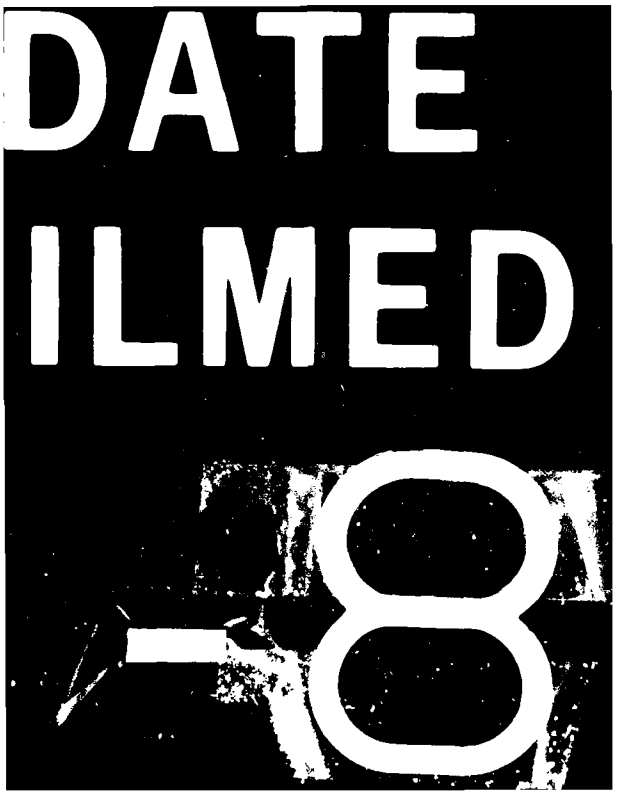
Wood, Jr., G.H., 1958. Geology of the Northern Half of the Minersville Quadrangle and a Part of the Northern Half of the Tremont Quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey C-43.

GEOLOGIC MAP - DYERS RUN DAM NO. 3



LEGEND

Pp — Pottsville Group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